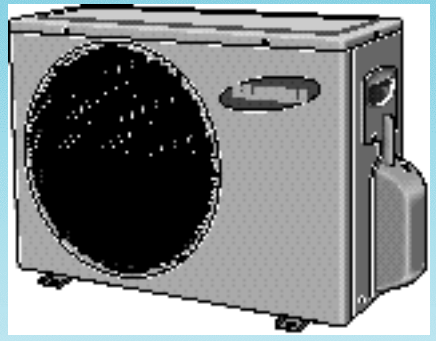
ROOM AIR CONDITIONER

INDOOR UNIT	OUTDOOR UNIT
AQV12F2VE	UQV12A0TE

SERVICE Manual

AIR CONDITIONER



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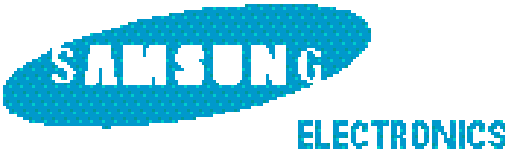

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1. Precautions

1. Warning: Prior to repair, disconnect the power cord from the circuit breaker.

2. Use proper parts: Use only exact replacement parts. (Also, we recommend replacing parts rather than repairing them.)

3. Use the proper tools: Use the proper tools and test equipment, and know how to use them. Using defective tools or test equipment may cause problems later-intermittent contact, for example.

4. Power Cord: Prior to repair, check the power cord and replace it if necessary.

5. Avoid using an extension cord, and avoid tapping into a power cord. This practice may result in malfunction or fire.

6. After completing repairs and reassembly, check the insulation resistance. Procedure: Prior to applying power, measure the resistance between the power cord and the ground terminal. The resistance must be greater than 30 megohms.

7. Make sure that the grounds are adequate.

8. Make sure that the installation conditions are satisfactory. Relocate the unit if necessary.

9. Keep children away from the unit while it is being repaired.

10. Be sure to clean the unit and its surrounding area.

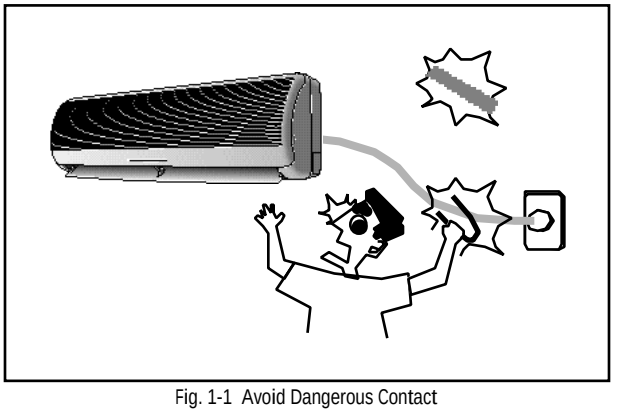

Fig. 1-1 Avoid Dangerous Contact

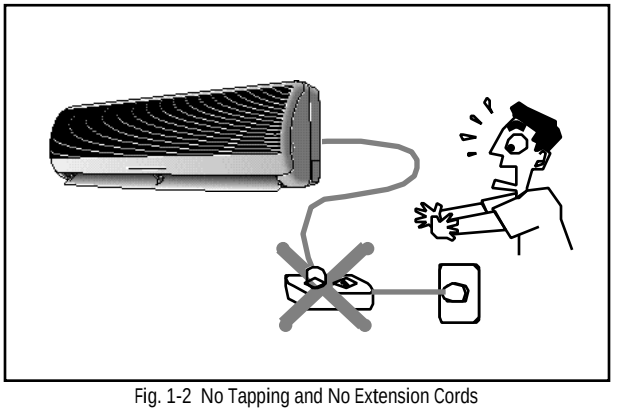

Fig. 1-2 No Tapping and No Extension Cords

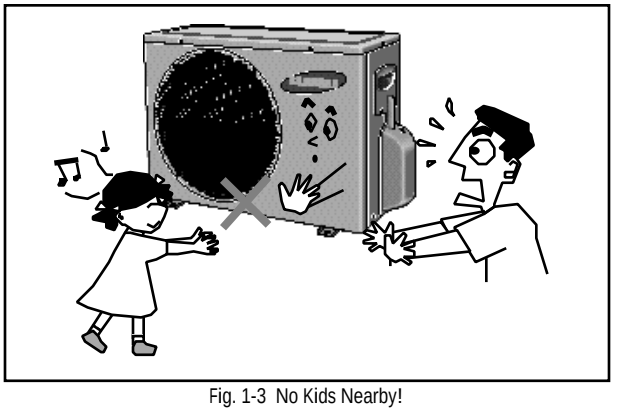

Fig. 1-3 No Kids Nearby!

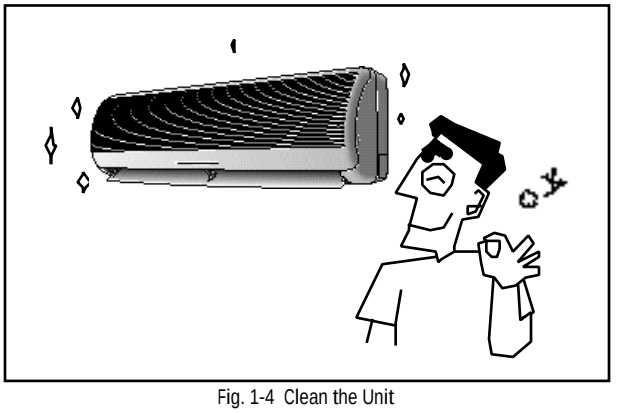

Fig. 1-4 Clean the Unit

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2. Product Specifications

2-1 Table

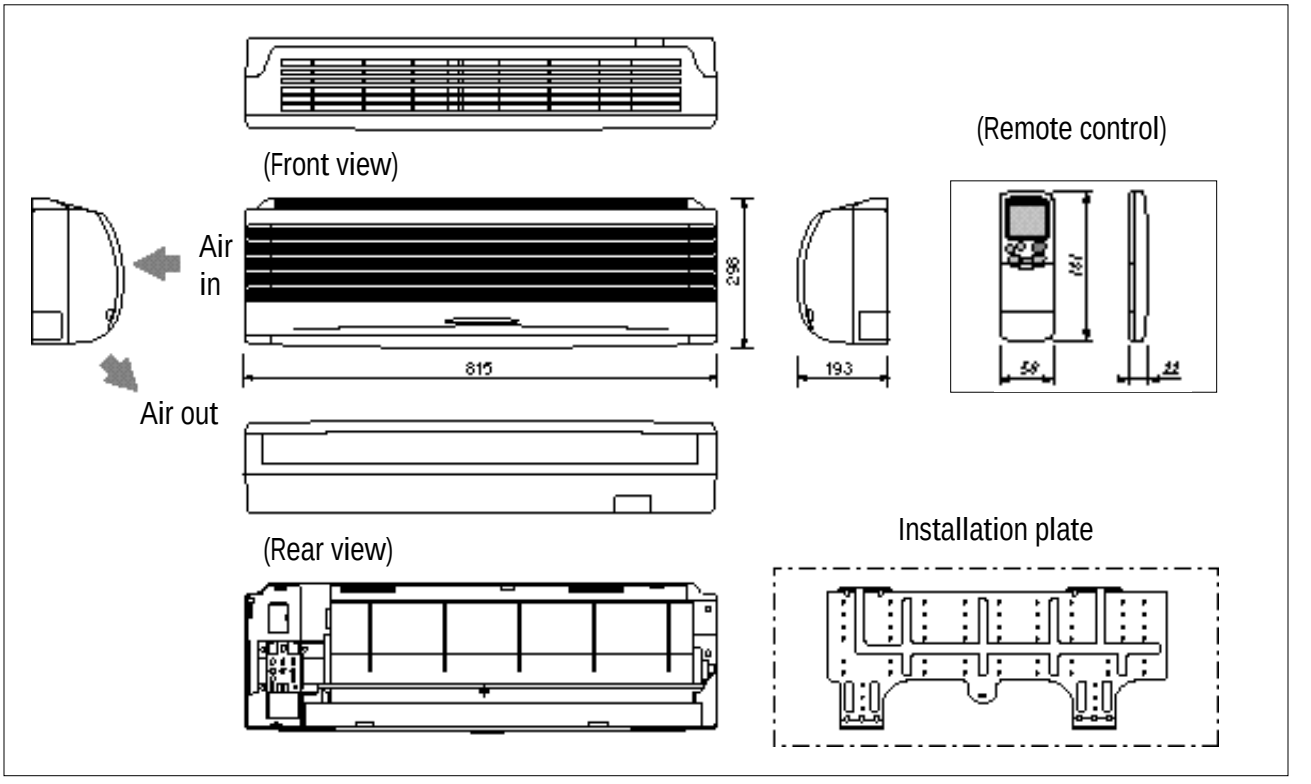
Item			Model (Indoor) (Outdoor)	AQV12F2VE UQV12A0TE	Remark
Power Source			ø-V-Hz	1-220/240-50	
Performance	Cooling	Capacity	W	3,500 (2,580~4,100)	
			Btu/h	12,000 (8,800~14,000)	
		Energy efficiency ratio	Btu/wh	9.4 (11.3~8.4)	
		Air flow	m^2/min	8.4	
		Moisture removal	L/h	1.9	
		Noise level Indoor	dBA	36~40	
		Outdoor		51	
	Heating	Capacity	W	3,800 (2580~4830)	
			Btu/h	13,000 (8800~16500)	
		Energy efficiency ratio	Btu/wh	9.8 (11.9~8.2)	
		Air flow	m^3/min	8.8	
		Noise level Indoor	dBA	34~38	
		Outdoor		52	
Electrical Rating	Available voltage range		V	187~264	
	Cooling	Running amperes	A	5.6 (3.7~7.1), (MAX 12A↓)	
		Power input	W	1,280 (780~1,650)	
		Power factor	%	95.0 (90.0~97.0)	
	Heating	Running amperes	A	5.7 (3.3~8.5), (MAX 12A↓)	
		Power input	W	1,330 (740~1,980)	
		Power factor	%	98.0(94.0~97.0)	
	Starting current		A	12 ↓	
	Fuse capacity		A X V	3.15X250 / 20X250	
	Power cord		A X V	12 X 250	
	Cable-connector		mm^2 X C	1.5 X 4	
Compressor	Type		-	Single Rotary	
	Model name		-	48V135RV1E4	
	Safety devices		-	204CT	
Fan motor	Indoor	Model name	-	AMPFS-040WTVB	
		Running capacitor	µF X VAC	1.5 X 450	
	Outdoor	Model name	-	AMASS-020WTVB	
		Running capacitor	µF X VAC	1.5 X 450	
Refrigerant tube		Narrow tube : Liquid	mm X MT	OD6.35 X 5	
		Wide tube : Gas	mm X MT	OD12.7 X 5	
Capillary tube		Cooling	mm	ID1.7 X 800	
		Heating	mm	ID1.7 X 600	
Refrigerant to charge (R22)			gr	1,000	
Dimension		Indoor unit : W x H x D		815x298x193	
		Outdoor unit : W x H x D		762x532x280	
Weight		Indoor unit		9.2	
		Outdoor unit		44.0	

Remark : Text condition

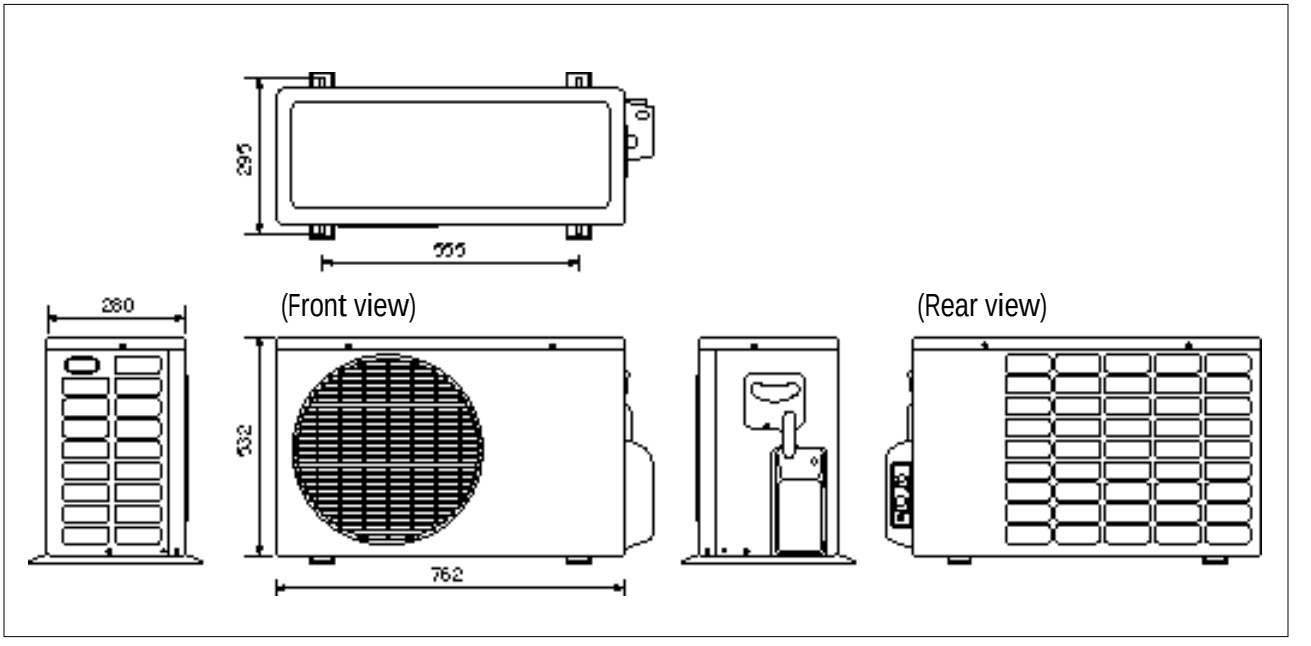
	Indoor room	Outdoor room
Cooling test	DB27˚C / WB19˚C	DB35˚C / WB24˚C
Heating test	DB20˚C / -	DB 7˚C / WB 6˚C

2-2 Dimensions

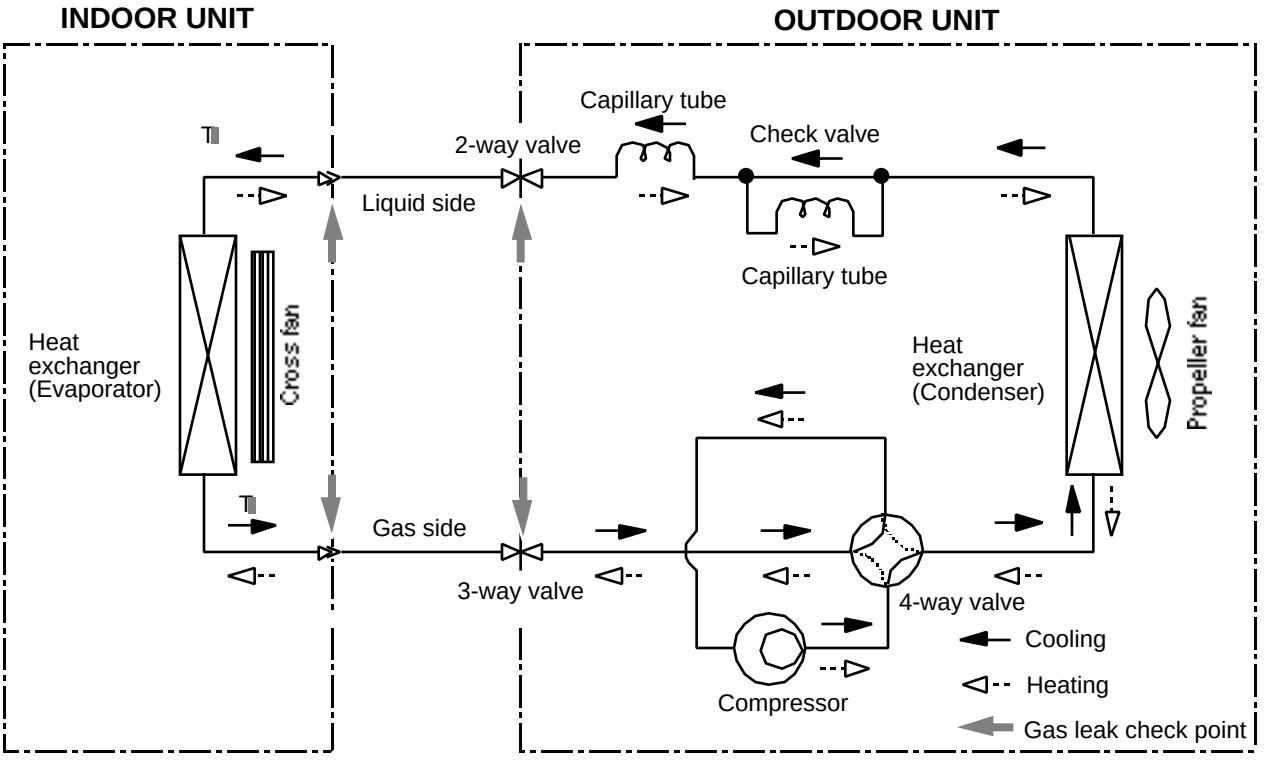
2-2-1 Indoor Unit



2-2-1 Outdoor Unit



2-3 Refrigerating Cycle Block Diagram



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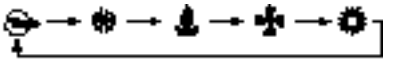
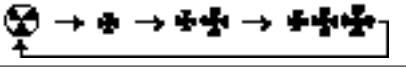
3. Operating Instructions and Installation

3-1 Operating Instructions

3-1-1 Name & Function of Key in remote controller

NO		NAMED OF KEY		FUNCTION OF KEY
1		⏻		On/Off Button. Use this button to start and stop air conditioner.
2		🌡	▲ (UP)	Temp up button. If the ▲ button is pressed once, the setting temperature is increased by 1°C
			▼ (DOWN)	Temp down button. If the ▼ button is pressed once, the setting temperature is decreased by 1°C
3		MODE		Each time you press this button, MODE is changed in the following order.  : Auto Mode : Cool Mode : Dry Mode : Fan Only Mode : Heat Mode
4		TURBO		Use this button to provide heavy duty cooling & Heating for 30 minutes.
5		OFF ⏻		Set up the reserve or cancel the timer on and timer off quickly
6		🌙		Use this button for sleep operation. (The SLEEP mode can be selected at COOL and HEAT mode.)
7				Adjusts air flow vertically.
8				Each time you press this button, FAN SPEED is changed in the following order. 
9	COVER	TIMER	ON TIMER	Set up the time that operation start.
10			OFF TIMER	Set up the time that operation stop.
11			SET	Use this button to reserve the timer on.
12			CANCEL	Use this button to reserve or cancel the timer on and timer off.
13			(UP)	If the button is pressed once, the time increase by one minute during the time set mode, and ten minutes during the timer set mode.
14			(DOWN)	If the button is pressed once, the time decrease by one minute during the time set mode, and ten minutes during the timer set mode.
15			TIME	Without regard to ON/OFF condition in remote controller, use this button to set current time. Adjust the current time using button. (Data can be transmitted after setting up the time)

3-1-2 Name & Function of Key in remote controller

1. AUTO MODE : In this mode, operation mode(COOL, HEAT) is selected automatically by the room temperature of initial operation.

Room Temp	Operation Type
Tr≥ 21°C+ΔT	Cool Operation (Set Temp:24°C+ΔT)
21°C +ΔT>Tr	Heat Operation (Set Temp : 22°C+ΔT)

   ΔT= -2°, -1°C, 0°C+1°C+2°C
   ΔT is controlled by setting temperature up(▲)/down(▼) key of remote controller

2. COOL MODE : The unit operates according to the difference between the setting and room temperature. (18°C~30°C)

3. HEAT MODE : The unit operates according to the difference between the setting and room temperature.(16°C~30°C)
   *Prevention against cold wind : For about 3~5 minutes after initial operation, thermo control or "defrost", the indoor fan will either not operate or operate very slowly, then switch to the selected fan speed. This period is to allow the indoor unit's heat-exchanger to prewarm before emitting warm air.
   *High temperature release function : The outdoor unit for and compressor ON/OFF control for safety operation, when the over-heat is heat exchanger of indoor unit.
   *Defrost : Deicing operation is controlled by outdoor unit's heat exchanger temperature and outdoor temperature and accumulating time of compressor's operation.
   De-ice end by sensing of the processing time by de-ice Condition.

4. DRY MODE :
   The unit operates in DRY mode.
   *Protective function : Low temperature release. (Prevention against freeze)

5. TURBO MODE : This mode is available in AUTO, COOL, HEAT, DRY, FAN, SLEEP Mode.
   When this button is pressed at first, the air conditioner is operated "powerful" state for 30 minutes regardless of the set temperature, room temperature.
   When this button is pressed again, or when the operating time is 30 minutes, turbo operation mode is canceled and returned to the previous mode.
   *But, if you press the TURBO button in DRY or FAN mode that is changed with AUTO mode automatically.

6. SLEEP MODE : Sleep mode is available only in COOL or HEAT mode.
   The operation will stop after 6 hours.
   *In COOL mode : The setting temperature is automatically raised by 1°C each 1hour When the temperature has been raised by total of 2°C, that temperature is maintained.
   *In HEAT mode : The setting temperature is automatically droped by 1°C each 1hour. When the temperature has been droped by total of 2°C, that temperature is maintained.

7. FAN SPEED : Manual / Auto
   Fan speed automatically varies depending on both the difference between setting and the room temperature.

8. COMPULSORY OPERATION :
   For operating the air conditioner without the remote controller.
   *AUTO : The operating is the same function that AUTO MODE in the remote controller.

9. SWING : BLADE-H is rotated vertically by the stepping motor.
   *Swing Set / Auto : Press the utton under the remote control is displayed on LCD the and the blades move up and down. about 3°. If the one more time press the utton, blatles location is stop.

10. Quick OFF TIMER: OFF timer (quick timer) allows reservation or cancel the timer on and timer off quickly
    When OFF timer button is pressed at operating state, LCD displays the polling state sequentially.
    The LCD also displays the time remaining.

11. 24-Hour ON / OFF Real Setting Timer. : The air conditioner is turned ON at a specified time using ON TIMER.
    OFF TIMER : The air Conditioner is turned OFF at a specified time using OFF TIMER.
    *ON TIMER : Only timer LED lights on.
    *OFF TIMER : Both timer and operation LED lights on.

12. BUZZER SOUND : Whenever the ON / OFF button is pressed or whenever change occurs to the condition which is set up or select, the compulsory operation mode, buzzer is sounded "beep"

13. SELF Diagnosis
    The indoor unit observes operation of the air-conditioner, and displays the results of self diagnosis on display pannel.

Operation	Defrost	Reservation	Power monitor	Fan	Turbo	Error mode
X	X	X	X	X	X	Operation off
◐	X	X	X	X	X	Power reset
X	X	◐	X	X	X	Trouble of indoor temperature sensor (open/short)
◐	X	◐	X	X	X	Temperature sensor trouble of the indoor heat exchanger (open/short)
X	X	X	X	◐	X	Stuck of the indoor fan motor (trouble of rotation)
◐	X	X	X	◐	X	Trouble of outdoor unit temperature sensor - Discharge temperature sensor - OLP temperature sensor of COMP top - Defrost temperature sensor - Outdoor temperature sensor
X	X	◐	X	◐	X	Communication trouble between the indoor and outdoor units (Misconnection or circuit trouble of the indoor and outdoor units)
X	X	X	X	X	◐	Abnormal increase of the operation current
X	X	◐	X	X	◐	Occurring of the inverter circuit instantaneous over current.
X	X	X	X	◐	◐	Abnormal increase of the COMP. Top and discharge gas temperature.
◐	◐	◐	LAMP ON	◐	◐	Refrigerant Refill operation (test operation)

(Lamp status)

◐ : Lamp flickering X: Lamp off

14. AUTO RESTART : The air conditioner starts immediately without control of remote controller when plugged.
    It's the case that the Auto-restart fanction works.
    * Auto restart function is the convenient function where the operation state is memorized in the Memory IC during the blackout and the operation restarts when the power comes back.

3-2 Installation

3-2-1 Selecting Area for Installation

Select an area for installation that is suitable to the customer's needs.

3-2-1(a) Indoor Unit

1. Make sure that you install the indoor unit in an area providing good ventilation. It must not be blocked by an obstacle affecting the airflow near the air inlet and the air outlet.
2. Make sure that you install the indoor unit in an area allowing good air handling and endurance of vibration of the indoor unit.
3. Make sure that you install the indoor unit in an area where there is no source of heat or vapor nearby.
4. Make sure that you install the indoor unit in an area from which hot or cool air is spread evenly in a room.
5. Make sure that you install the indoor unit in an area away from TVs, audio units, cordless phones, fluorescent lighting fixtures and other electrical appliances (at least 1 meter).
6. Make sure that you install the indoor unit in an area which provides easy pipe connection with the outdoor unit, and easy drainage for condensed water.
7. Make sure that you install the indoor unit in an area which is large enough to accomodate the measurements shown in figure on the next page.

3-2-1(b) Outdoor Unit

1. Make sure that you install the outdoor unit in area not exposed to the rain or direct sun light.
   (Install a separate sunblind if exposed to direct sun light.)
2. Make sure that you install the outdoor unit in area allowing good air moment, not amplifying noise or vibration, especially to avoid disturbing neighbours.
   (Fix the unit firmly if it is mounted in a high place.)
3. Make sure that you install the outdoor unit in area providing good ventilation and which is not dusty. It must not be blocked by any obstacle affecting the airflow near the air inlet and the air outlet.
4. Make sure that you install the outdoor unit in area free from animals or plants.
5. Make sure that you install the outdoor unit in area not blocking the traffic.
6. Make sure that you install the outdoor unit in area easy to drain condensed water from the indoor unit.
7. Make sure that you install the outdoor unit in area which provides easy connection within the maximum allowable length of a coolant pipe(10 meters).

   Note
   1. Add 10 grams of refrigerant (R-22) for every 1 meter if the pipe length exceeds the standard pipe length of 5 meters.
   2. Maintain a height between the indoor and outdoor units of less than 3 meters.
8. Make sure that you install the outdoor unit in an area which is large enough to accommodate the measurements shown in figure on the next page.

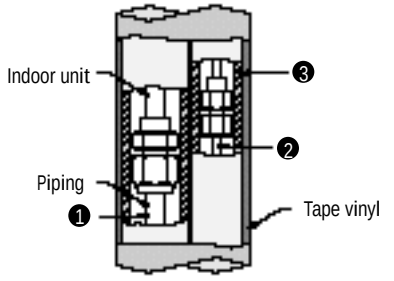
3-2-1(c) Remote Control Unit

1. Make sure that you install the remote control unit in an area free from obstacles such as curtains etc, which may block signals from the remote control unit.
2. Make sure that you install the remote control unit in an area not exposed to direct sunlight, and where there is no source of heat.
3. Make sure that you install the remote control unit in an area away from TVs, audio units, cordless phones, fluorescent lighting fixtures and other electrical appliances (at least 1 meter).

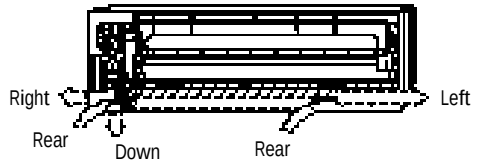
Caution :
It is harmful to the air conditioner if it is used in the following environments: greasy areas (including areas near machines), salty areas such as coast areas, areas where sulfuric gas is present such as hot spring areas. Contact your dealer for advice.

3-2-2 Installation diagram of indoor unit and outdoor unit

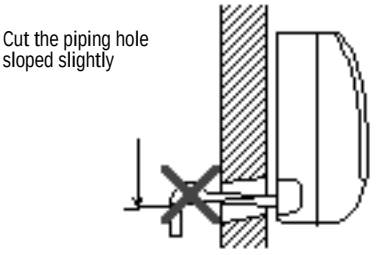
A Indoor unit gas leak test check point

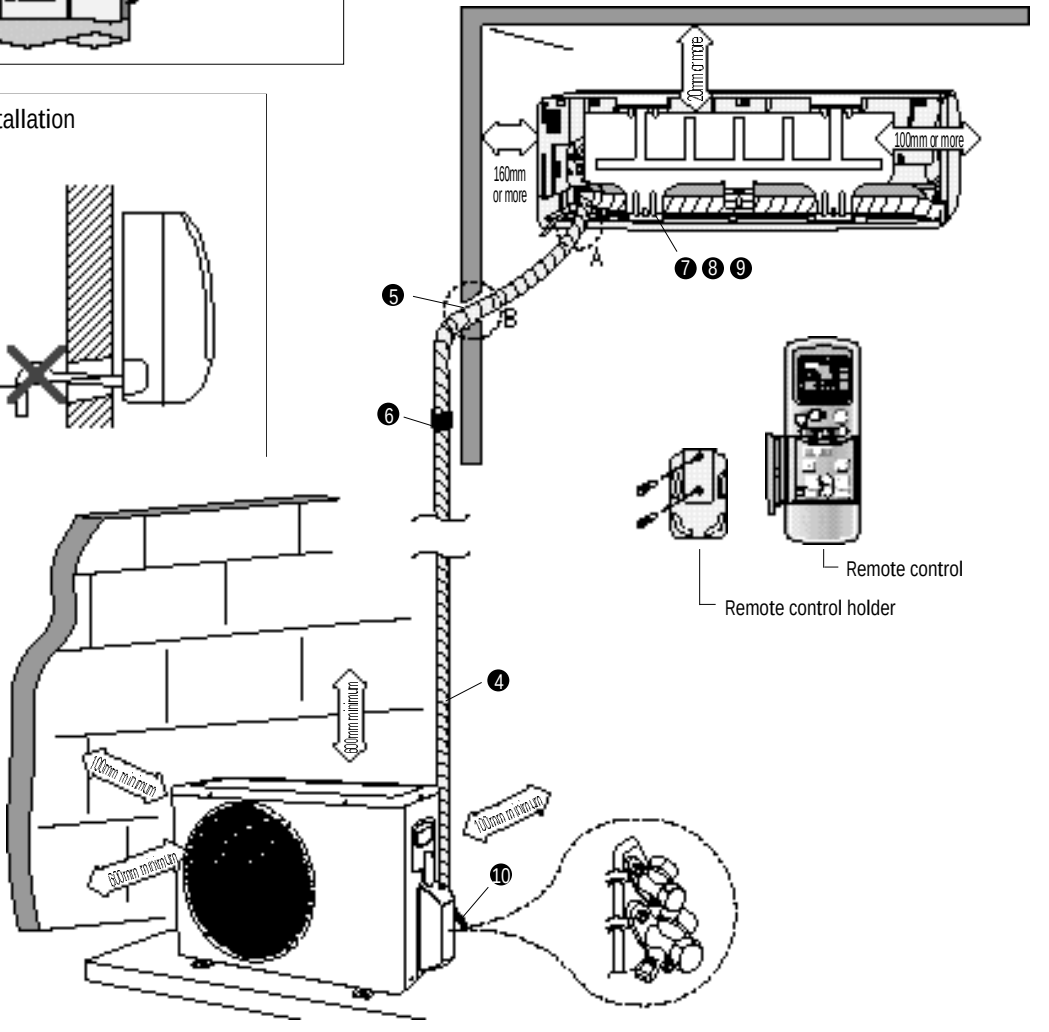


Piping may be laid to the rear, left, right or down .



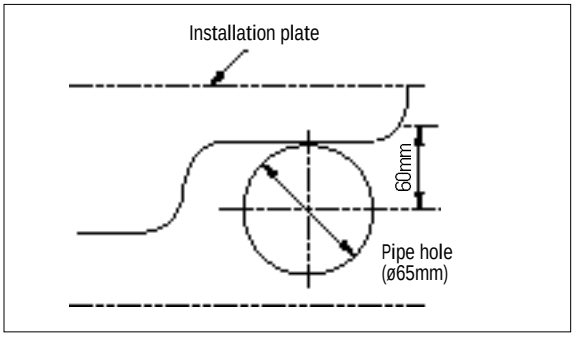
B Drain hose installation





❶	Piping (Liquid) 1/4"		❻	Clamper tube
❷	9K BTU 12K BTU	Piping(Gas)3/8” Piping(Gas)1/2”	❼	Installation plate
❸	Installation tube		❽	Pipe-connection
❹	Vinyl tape		❾	Screw
❺	Putty		❿	Drain hose

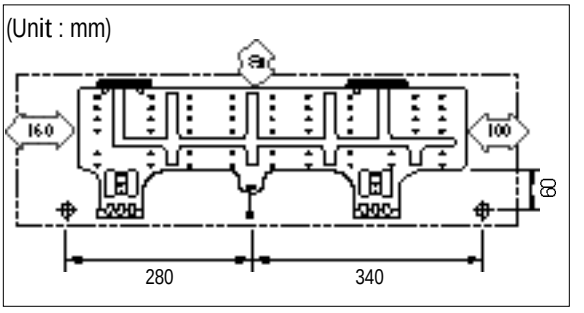
3-2-2(a) Fixing the Installation Plate



1. Determine the position of the pipe and drain hose hole using the right figure and drill the hole with an inner diameter of 65mm so that it slants slightly downwards.

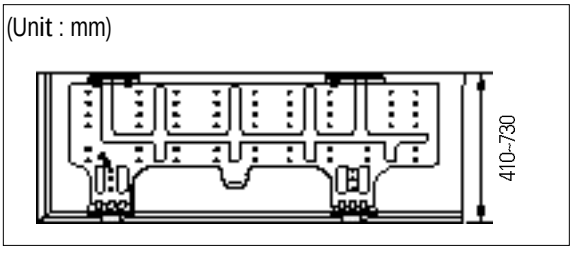
2. **If you are fixing the indoor unit to a… Then follow Steps…**

Wall	**3.**
Window frame	**4 to 6.**



3. Fix the installation plate to the wall in a manner appropriate to the weight of the indoor unit.

   If you are mounting the plate on a concrete wall with anchor bolts, the anchor bolts must not project by more than 20mm.

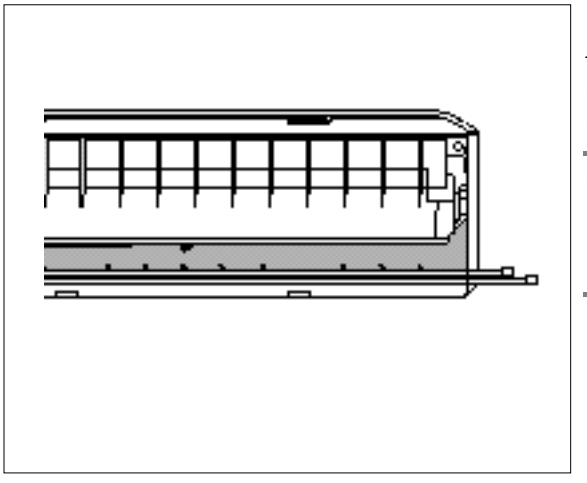


4. Determine the positions of the wooden uprights to be attached to the window frame.

5. Attach the wooden uprights to the window frame in a manner appropriate to the weight of the indoor unit.

6. Using tapped screws, attach the installation plate to the wooden uprights, as illustrated in the last figure opposite.

3-2-2(b) Purging the Unit



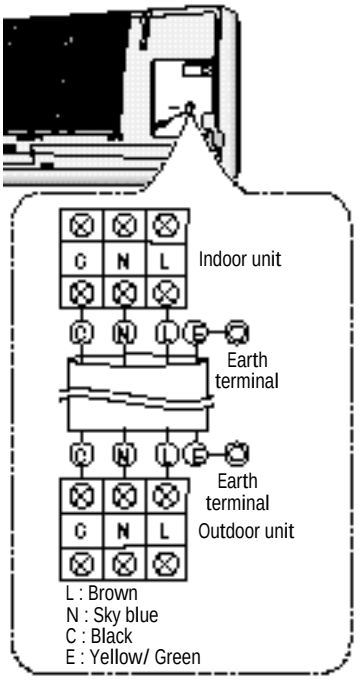
On delivery, the indoor unit is loaded with an inert gas. All this gas must therefore be purged before connecting the assembly piping. To purge the inert gas, proceed as fol - lows.

Unscrew the caps at the end of each pipe.

Result : All inert gas escapes from the indoor unit.

- **To prevent dirt or foreign objects from getting into the pipes during installation, do NOT remove the caps completely until you are ready to connect the piping.**

3-2-2(c) Connecting the Assembly Cable.

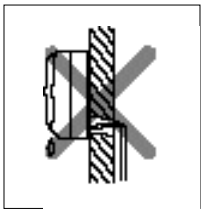


The outdoor unit is powered from the indoor unit via the assembly cable. If the outdoor unit is more than five metres away from the indoor unit, the cable must first be extended to a maximum of ten metres.

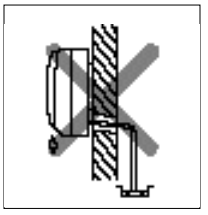
1. Extend the assembly cable if necessary.
2. Open the front grille by pulling on the tabs on the lower right and left sides of the indoor unit.
3. Remove the screw securing the connector cover.
4. Pass the assembly cable through the rear of the indoor unit and connect the assembly cable to terminals C, N, L, E.
   - Each wire is labelled with the corresponding terminal number.
5. Firmly fix the ass'y cable with clamp wire holder.
6. Pass the other end of the cable through the 65mm hole in the wall.
7. Replace the connector cover, carefully tightening the screw.
8. Close the front grille.

3-2-2(d) Installing and Connecting the Indoor Unit Drain Hose

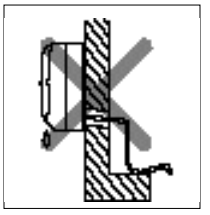
Care must be taken when installing the drain hose for the indoor unit to ensure that any condensa - tion water is correctly drained outside.l When passing the drain hose through the 65mm hole drilled in the wall, check that none of the following situations occur.



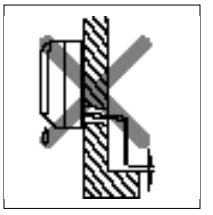
The hose must NOT slope upw ards.



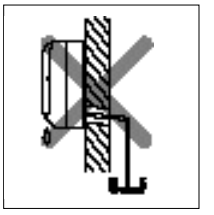
The end of the drain hose must NOT be placed in water.



Do NOT bend the hose in different directions.



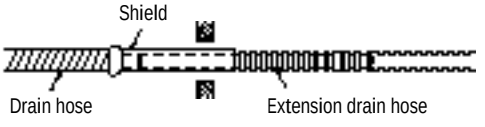
Keep a clearance of at least 5cm between the end of the hose and the ground.



Do NOT place the end of the drain hose in a hollow.

To install the drain hose, proceed as follows.

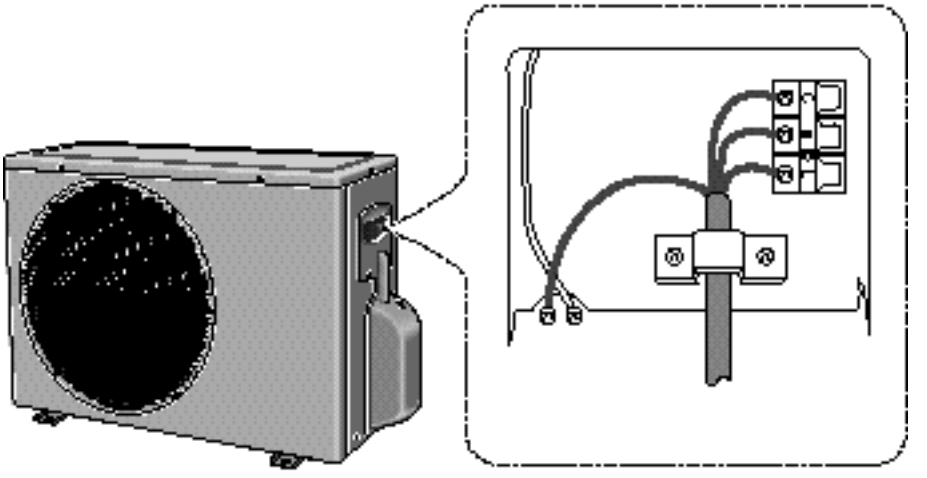
1. If necessary, connect the 2-metre extension to the drain hose.
2. If you are using the extension, insulate the inside part of the extension drain hose with a shield.
3. Pass the drain hose under the refrigerant piping, taking care to keep the drain hose tight.
4. Pass the drain hose through the hole in the wall, making sure that it is sloping downwards, as shown in the illustrations above.



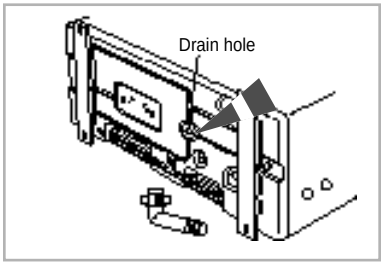
3-2-2(e) Outdoor unit installation

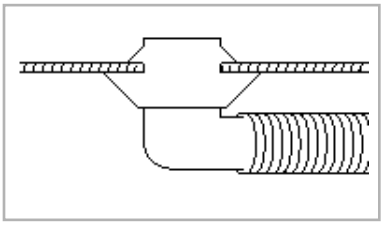
Wiring connection

1. Remove the Handle-Cabi RH.
2. Firmly connect the cable connector in the terminal block.
3. Fasten the terminal to the hole marked
4. Firmly fix the ass'y cable with clamp wire holder.
5. Assemble the Handle-Cabi RH.



Installing and Connecting the Outdoor Unit Drain Hose





When using the air conditioner in the heating mode, ice may accumu - late. During de-icing, the condensed water must be drained off safely. Consequently, you must install a drain hose on the outdoor unit, fol - lowing the instructions below.

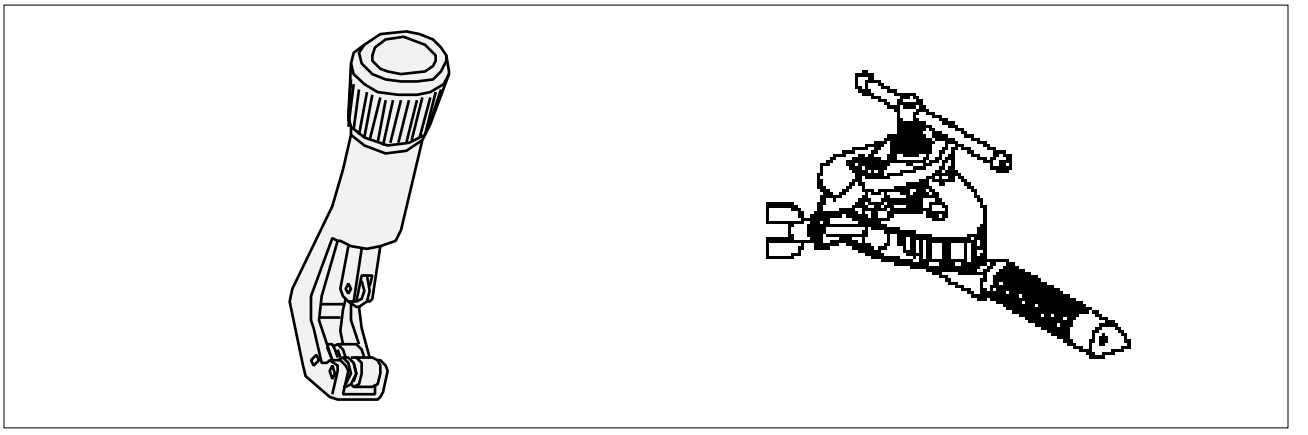
1 Insert the drain plug into the drain hole on the underside of the outdoor unit.

2 Connect the drain hose to the drain plug.

3 Ensure that the drained water runs off correctly and safely.

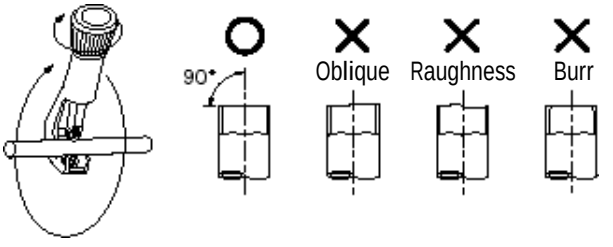
3-2-2(f) Flare Modification

• Tools used



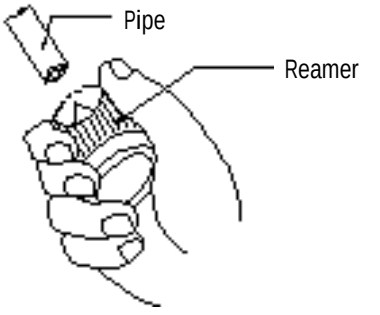
Flare modification procedure

1) Cut the pipe using a pipe cutter.

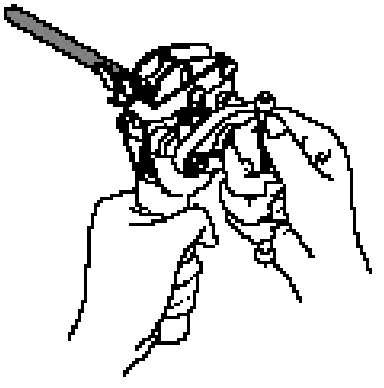


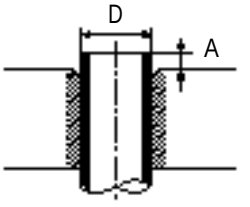
2) Remove burrs at the tip of the pipe cut.

Caution : Burrs not removed may result in leakage of gas.



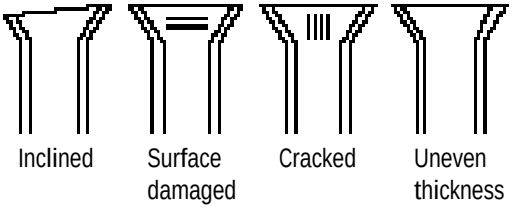
3) Insert a flare nut into the pipe and modifty flare.





Outer diameter	A(mm)
ø6.35mm	1.3
ø9.52mm	1.8
ø12.7mm	2.0

* Unproper flaring



3-2-2(g) Air-Purge Procedure

• Use the refrigerant of the outdoor unit to purge air inside indoor unit and pipe.

1. Remove the caps from the 2-way valve(B) and the 3-way valve(A).

2. Turn the 2-way valve cock approx. 45° counterclockwise to open it. Close it about 10 seconds later.

3. Check refrigerant leakage of each joint parts (A, B, C & D in right figure)

not leaking

Leaking

If leaking, tighten the flare nut one more time. If continues to leak, although the pipe fixing area has been tightened again, repair the leaking area.

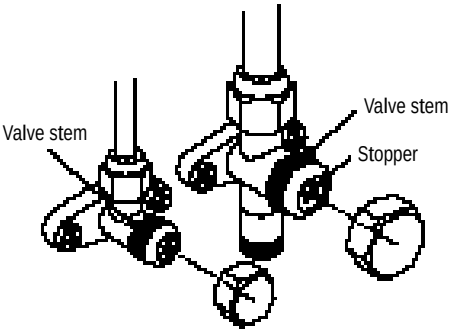
4. Open the 2-way valve again.

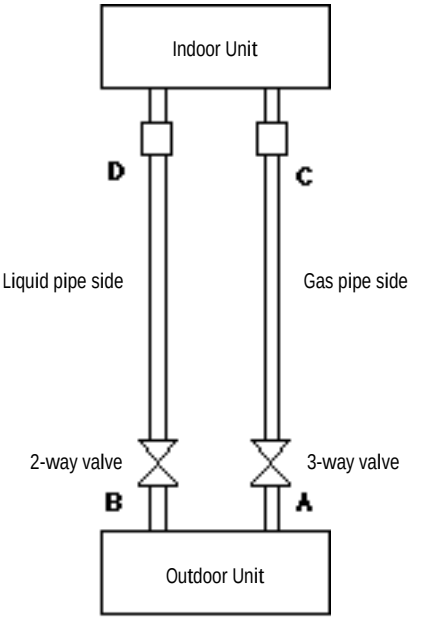
5. Open the service valve cap of the 3-way valve and press the needle valve to discharge gas for 3 seconds and leave it for about 1 minute.
Repeat the above procedure for 3 times to purge air.

6. Open the 2-way valve and 3-way valve completely

7. Close the cap of each valve.

8. Check each valve for leakage.





3-2-2(h) Refrigerant Refill

• Refill an air-conditioner with refrigerant when refrigerant has been leaked at installing or using

1. Purge air(for new installation only).

2. Turn the 3-way valve clockwise to close, connect the pressure gauge(low pressure side) to the service valve, and open the 3-way valve again.

3. Connect the tank to refill with Refrigerant

4. Set the unit to Low pressure checking mode.
   * Press the ON/OFF switch for 5 second.
   *All the lamp is blink on the indoor unit.

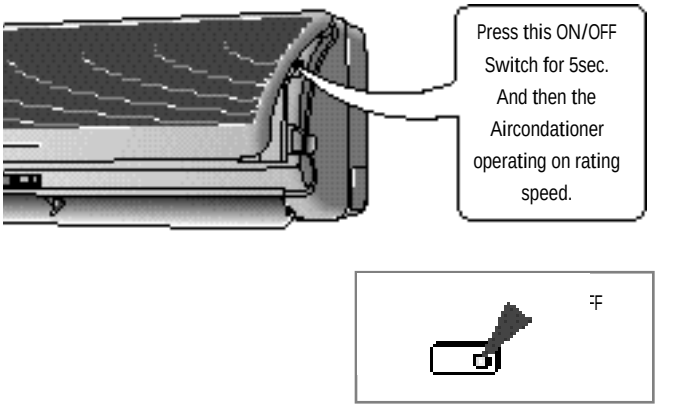
5. Check the pressure indicated by the pressure gauge(low pressure side).
   * Refer to Low pressure graph.

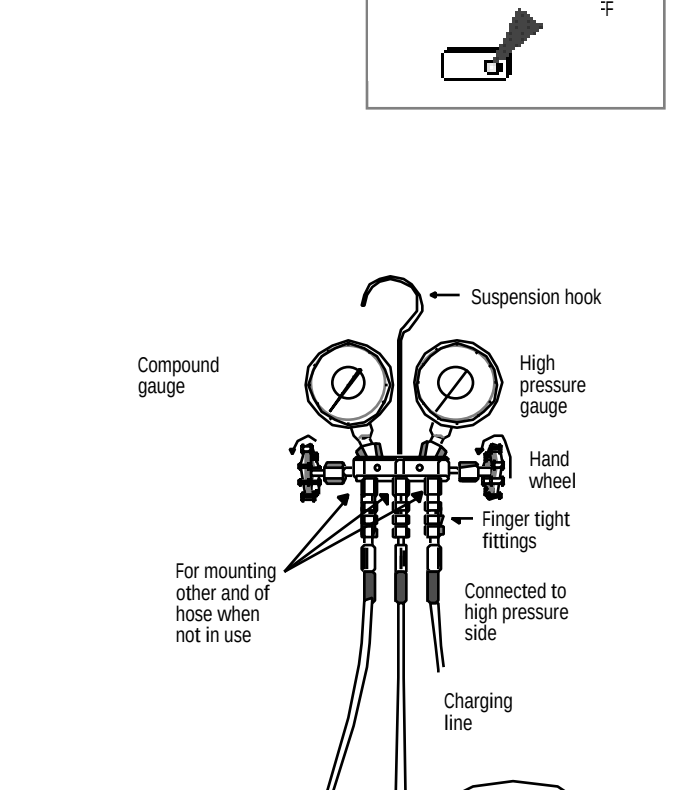
6. Open the refrigerant tank and fill with refrigerant until the rated pressure is reached.
   * It is recommended not to pour the refrigerant in too quickly, but gradually while operating a pressure valve.

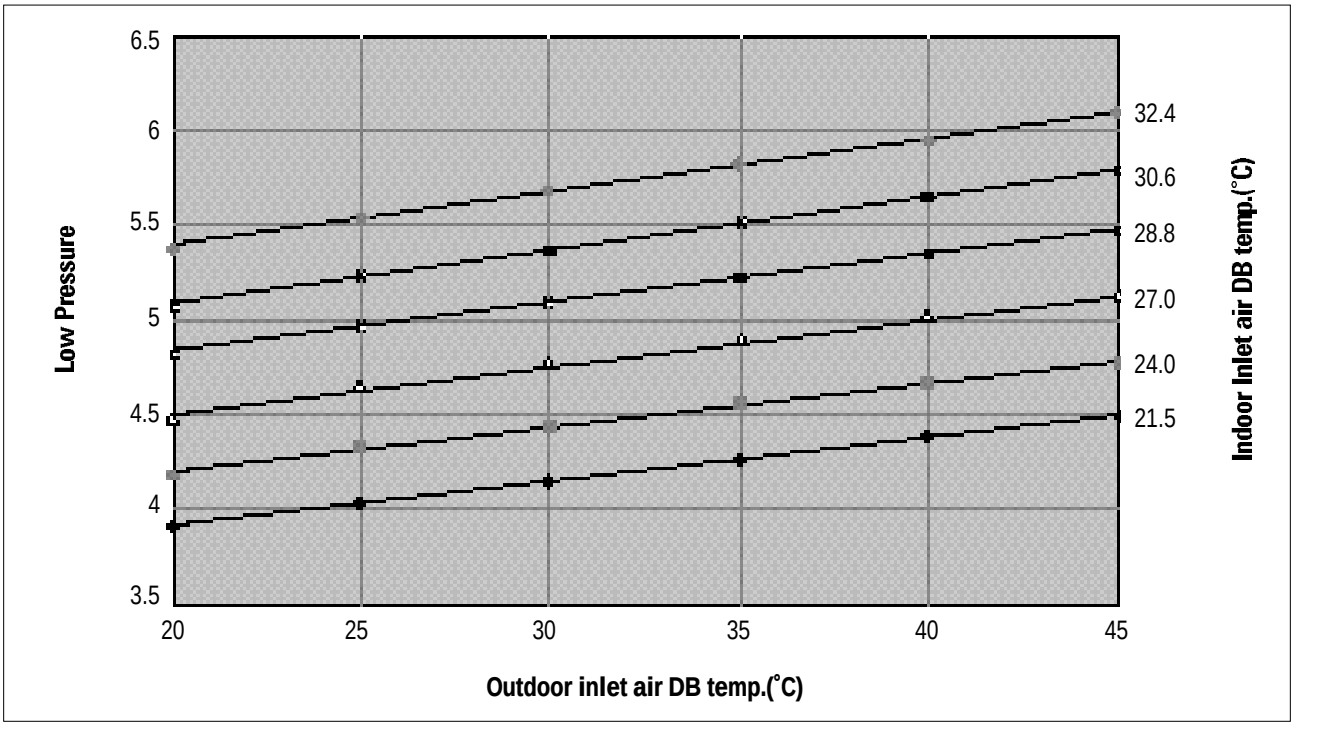
7. Stop operation of the air conditioner.

8. Close the 3-way valve, disconnect the pressure gauge, and open the 3-way valve again.

9. Close the cap of each valve.







3-2-2(i) Refrigerant Adjustment

Class	At installation		At service	
Connection Pipe Length	Air-Purge Method	Refrigerant Adjustment	Air-Purge Method	Refrigerant Quantity
5m Max.	Refer to the detailed Air-Purge Procedure	Unnecessary	Purge air using a vaccum pump or an additional refrigerant cylinder.	refer to specification sheet
5~10m		Add 10g of refrigerant (R-22) for every 1m.		Add 10g of refrigerant (R-22) for every 1m.

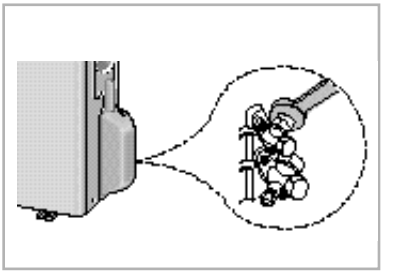
3-2-2(j) Flare unt fixing torque

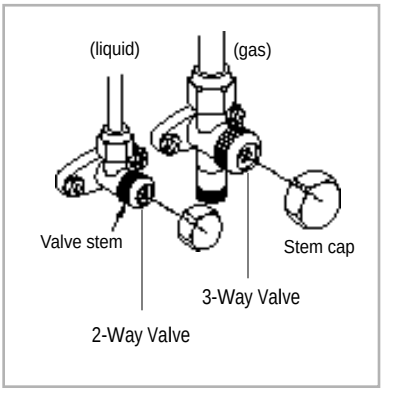
Outter diameter	Torque (kg-cm)	
	Fixing Torque	Final Torque
ø 6.35 (9000Btu, 12000Btu) (Liquid Side)	160	200
ø 9.52 (9000Btu) (Gas Side)	300	350
ø 12.7 (12000Btu) (Gas Side)	500	550

3-2-2(k) "Pump down" Procedure

- Pump down' shall be carried out when an evaporator is replaced or when the unit is relocated in another area.

1. Remove the caps from the 2-way valve and the 3-way valve.
2. Turn the 3-way valve clockwise to close and connect a pressure gauge(low pressure side) to the service valve, and open the 3-way valve again.
3. Set the unit to cool operation mode. (Check if the compressor is operating.)
4. Turn the 2-way valve clockwise to close.
5. When the pressure gauge indicates "0" turn the 3-way valve clockwise to close.
6. Stop operation of the air conditioner.
7. Close the cap of each valve.





Relocation of the air conditioner

- Refer to this procedure when the unit is relocated.

1. Carry out the pump down procedure (refer to the details of 'pump down').
2. Remove the power cord.
3. Disconnect the assembly cable from the indoor and outdoor units.
4. Remove the flare nut connecting the indoor unit and the pipe.
   At this time, cover the pipe of the indoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
5. Disconnect the pipe connected to the outdoor unit.
   At this time, cover the valve of the outdoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
6. Make sure you do not bend the connection pipes in the middle and store together with the cables.
7. Move the indoor and outdoor units to a new locatioon.
8. Remove the mounting plate for the indoor unit and move it to a new location.

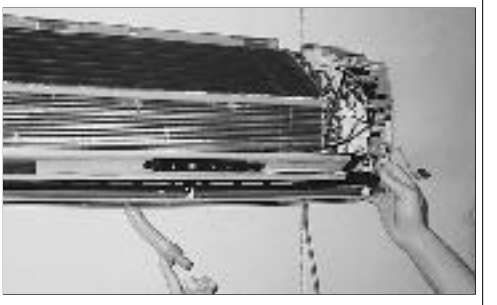
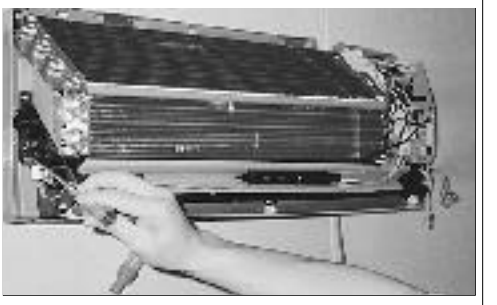
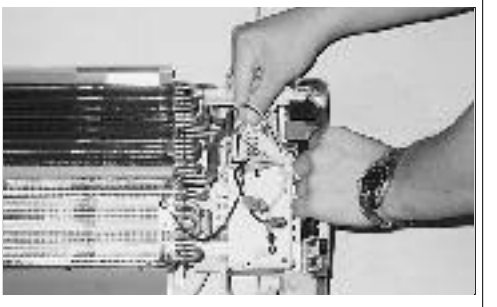
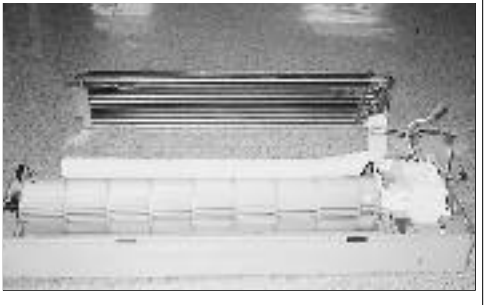
MEMO

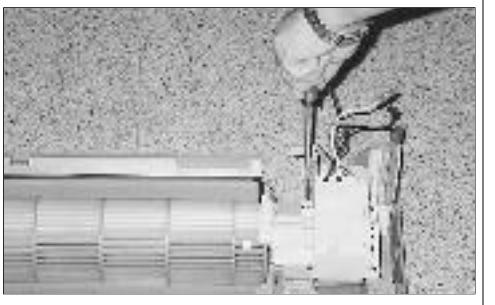
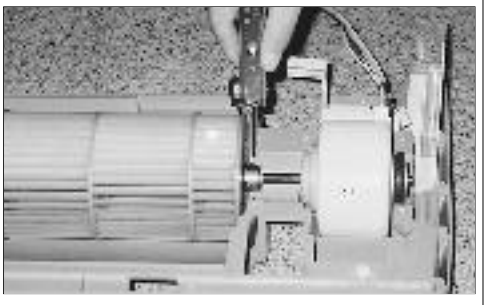
4. Disassembly and Reassembly

Stop operation of the air conditioner and remove the power cord before repairing the unit.

4-1 Indoor Unit

No	Parts	Procedure	Remark
1	Front Grille	1) Stop the air conditioner operation and block the main power. 2) Separate tape of front panel upper.	
		3) Contract the second finger to the left, and right handle and pull to open the inlet grille. 4) Take the left and right filter out. * Take the Deadorizing and Electrostatic filter out. (ONLY “1” and “5” Series models) 5) Loosen one of the right fixing screw and separate the terminal cover.	
		6) Loosen three fixing screws of front grille.	
		7) Pull the upper left and right of discharge softly for the outside cover to be pulled out.	
		8) Pull softly the lower part of discharge and push it up. **Caution;** Assemble the front panel and fix the hooks of left and right.	

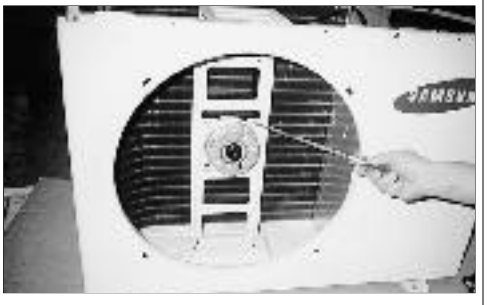
No	Parts	Procedure	Remark
2	Ass'y Tray Drain.	1) Do "1", above. Separate the drain hose from the extension drain hose. 2) Take the display PCB out. (Center of indoor unit) 3) Loosen three fixing screws of left and right 4)Pull tray drain out from the back body.	 
3	Electrical Parts (Main PCB)	1) Do "1", "2", above 2) Take all the connector of PCB upper side out. (Inclusion Power cord) 3) Separate the outdoor unit connection wire from the terminal block. 4) If pulling the Main PCB up. it will be taken out. (Separate the TRANS hook. it before).	
4	Heat Exchanger	1) Do "1" and "2", "3", above 2) Loosen two fixing earth screws of right side. 3) Separate the connection pipe. 4) Separate the bush body at the upper side and holder at the rearside. 5) Loosen the two fixing screws of left side. 6) Lifting the heat exchanger up a little to push the up side for separation from the indoor unit.	 

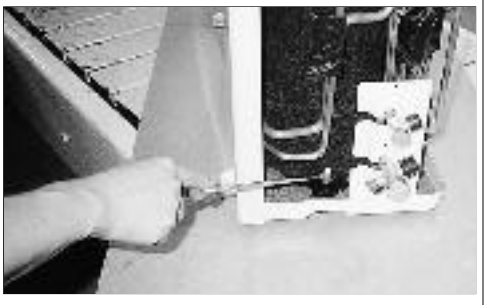
No	Parts	Procedure	Remark
5	Fan Motor and Cross Fan	1) Do “1” “2” ”3” “4”, above. 2) Loosen the fixing three screws and separate the motor holder. 3) Loosen the fixing screw of fan motor. (By use of M3 wrench) 4) Separate the fan motor from the fan. 5)Separate the fan from the left holder bearing.	 

4-2 Outdoor Unit

Take care of the electrical shock by contact on the charging parts before the discharge after power off. (If takes approximately 2minutes to discharge.)

No	Parts	Procedure	Remark
1	Common Work & Ass'y-control Out	1) Loosen the fixing screw and separate the Handle-Cabi RH. 2) Separate the Cable-Connector Wire from the Terminal-Block.	
		3) Loosen six fixing screws and separate the Cabi-Upper. 4) Loosen four fixing screws from the Ass'y-Control Out.	
		5) Separate the Terminal-Housing from the Ass'y-Control Out. 6) Separate the Ass'y-Control Out from the outdoor unit.	
		7) Loosen five fixing screws and separate the Cabi-Side.	

No	Parts	Procedure	Remark
2	Fan-Motor	1) Loosen fixing screw of the Guard-Fan. 2) Turn the Guard-Fan to separate from the Cabi-Front.	
		4) Remove the nut flange (Turn to the right to remove, as it is a left hand screw) 5) Separate the fan.	
		6) Loosen four fixing screws to separate the motor.	
3	Heat Exchanger	1) Do “1”, above. 2) Loosen four fixing screws of Ass’y-Frame and Partition. 3) Disassemble the inlet and outlet pipe by welding. 4) Separate the heat exchanger.	

No	Parts	Procedure	Remark
4	Compressor	1) Do “1”, above. 2) Open the terminal cover of compressor and unscrew the connection terminal. 3) Disassemble the inlet and outlet pipe of compressor by welding. 4) Disassemble the inlet and outlet pipe of condenser by welding	
		5) Loosen the three bolts of the lower part. 6) separate the compressor.	

5. Troubleshooting

Since the inverter air conditioner is equipped with Electrical control circuits at both Indoor & outdoor unit, the trouble shooting shall be performed according to the error mode.
Inside the controller of the outdoor unit (inverter), the large capacity of electrolytic condenser so that it takes the time to discharge after the power off since the electrical charge remains (the charging voltage DC 340V).
Take care of the electrical shock by contact on the charging part before the discharge after the power off. (It takes approximately 2 minutes to discharge).

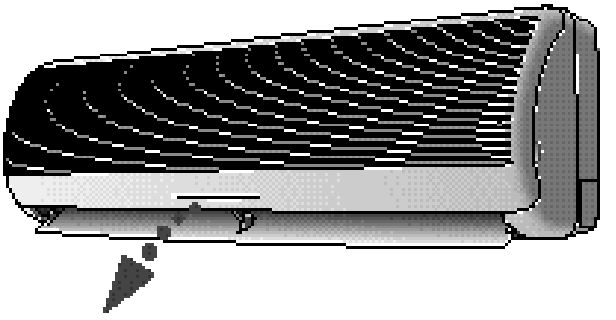
5-1 Basic items for trouble shooting

1) Is the power source proper?
   The power source shall be in the range of the rated voltage ±10% If it is out of this range, it may cause the abnormal operation.
2) Is the connection made between the indoor and outdoor unit?
   The connection between indoor and outdoor unit shall be performed with 4 wire. (connection cable of indoor and outdoor unit + ground wire).
3) The phenomena as follows are not out of order.

NO	Phenomena	Cause and reason
1	The operation is not done.	• Is the power off or the power unplugged? • Does it stop because it is the completion time? • Unplug and plug again the power source for 2 minutes.
2	The wind comes out but the heating/cooling is not performed.	• Is the filter clogged with dust or dirty? • Is there any direct light on the outdoor unit or any obstacle against it? • Is the selected temperature too high? Lower the selected temperature lower than the current one (during cooling). • Is the selected temperature too low? Raise the desired temperature than the current one? • Is the “Fan only Mode” operation?
3	The remote controller does not operate.	• Is the battery run out? • Is the battery inserted in the wrong way(+, -)? • Is the detection part of the indoor unit blocked? • Does it interfered with the radio of neon sign?
4	The wind volume is not adjusted.	• Is the operation selected among one of Auto / Dry / Turbo / Sleeping? • The temperature setting is not required since the wind volume set automatically. • Check again at the state of Cooling / Fan only / Heating.
5	The reservation does not operate.	• Is the current time input? The reservation can be made only when the current time is input. • Is it on the stop condition? The reservation can not be made at the stop state. Press the Operation / Stop button to make the reservation.
6	The temperature is not set.	• Is the operation selected among the Dry / Turbo / Sleeping / Fan only Mode. Since the temperature is automatically set, the temperature setting is not required. • Check again at the cooling/heating state. • The standard temperature ±2˚C during the automatic operation.
7	The operation lamp continues to be flickering.	• Push the Operation / Stop button. • Unplug and plug the power source.
8	The immediate operation starts without control of remote controller when plugged	• It is the case that the auto restart function works. # Auto restart function is the convenient function where the operation state is memorized in the Memory IC during the blackout and the operation restarts when the power comes back.

5-2 The first determination method of troubled part

5-2-1 Error mode display of indoor unit

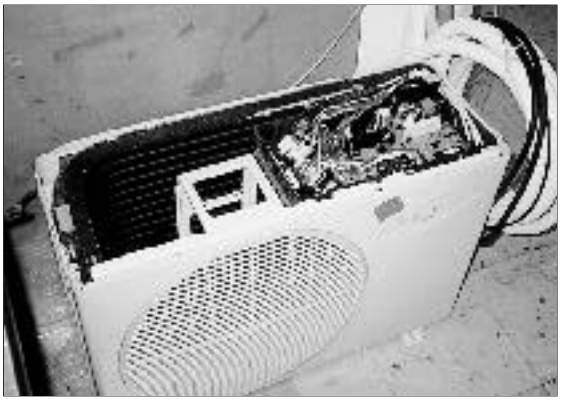


Opera-tion	Defrost	Reserva-tion	Power monitor	Fan	Turbo	Error mode
X	X	X	X	X	X	Operation off
◐	X	X	X	X	X	Power reset
X	X	◐	X	X	X	Trouble of indoor temperature sensor (open/short)
◐	X	◐	X	X	X	Temperature sensor trouble of the indoor heat exchanger (open/short)
X	X	X	X	◐	X	Stuck of the indoor fan motor (trouble of rotation)
◐	X	X	X	◐	X	Trouble of outdoor unit temperature sensor - Discharge temperature sensor - OLP temperature sensor of COMP top - Defrost temperature sensor - Outdoor temperature sensor
X	X	◐	X	◐	X	Communication trouble between the indoor and outdoor units (Misconnection or circuit trouble of the indoor and outdoor units)
X	X	X	X	X	◐	Abnormal increase of the operation current
X	X	◐	X	X	◐	Occurring of the inverter circuit instantaneous over current.
X	X	X	X	◐	◐	Abnormal increase of the COMP. Top and discharge gas temper-ature.
◐	◐	◐	LAMP ON	◐	◐	Refrigerant Refill operation (test operation)

(Lamp status)

◐ : Lamp flickering X: Lamp off

5-2-2 Error mode display of outdoor unit board



			ERROR MODE
RED	GREEN	YELLOW	
X	X	X	Operation off
●	◐	X	Indoor-outdoor unit normal communication and operation
●	X	X	Abnormal communication between the indoor and outdoor unit (miconnection or trouble of circuit between the indoor and outdor unit)
X	X	X	Trouble of the control power of the outdoor(+12V)
X	X	◐	Instantaneous over current of inverter circuit
●	X	◐	Abnormal increase of the discharge temperature
X	●	◐	Abnormal increase of operation current
●	●	◐	Abnormal increase of comp top temperature.
◐	X	◐	Trouble of outdoor temperature sensor (open/short)
◐	◐	◐	Trouble of the OLP temperature sensor (open/short)
◐	●	◐	Trouble of outdoor Heat exchanger temperature sensor (defrost temperature sensor) (open/short)

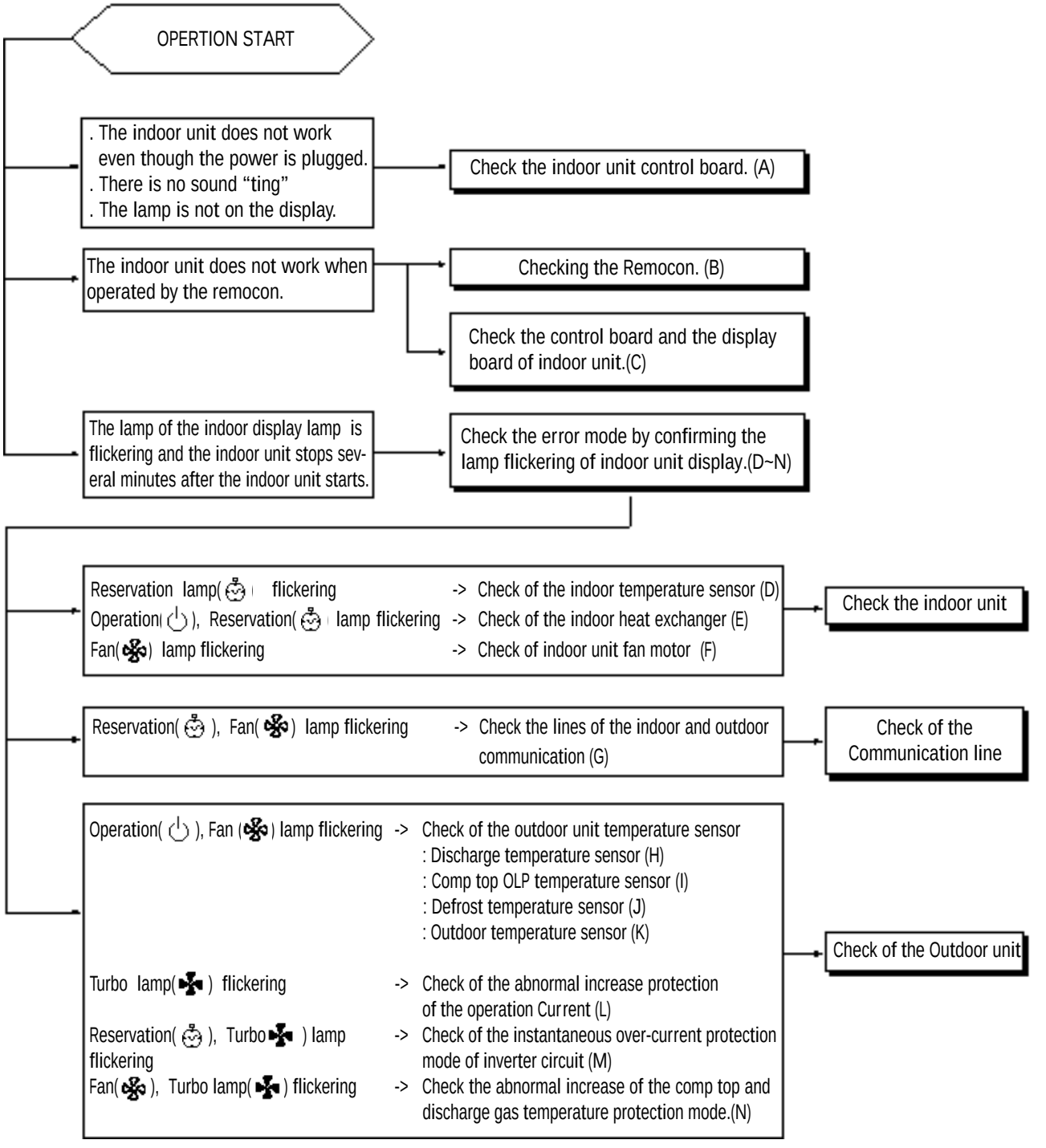
(LAMP)

● : LAMP ON

◐ AMP FLICKERING

X : LAMP OFF

5-3 Sequence of trouble shooting for inverter aircon


OPERTION START
. The indoor unit does not work even though the power is plugged.
. There is no sound “ting”
. The lamp is not on the display.
Check the indoor unit control board. (A)
The indoor unit does not work when operated by the remocon.
Checking the Remocon. (B)
Check the control board and the display board of indoor unit.(C)
The lamp of the indoor display lamp is flickering and the indoor unit stops several minutes after the indoor unit starts.
Check the error mode by confirming the lamp flickering of indoor unit display.(D~N)
Reservation lamp( ) flickering -> Check of the indoor temperature sensor (D)
Operation( ), Reservation( ) lamp flickering -> Check of the indoor heat exchanger (E)
Fan( ) lamp flickering -> Check of indoor unit fan motor (F)
Check the indoor unit
Reservation( ), Fan( ) lamp flickering -> Check the lines of the indoor and outdoor communication (G)
Check of the Communication line
Operation( ), Fan ( ) lamp flickering -> Check of the outdoor unit temperature sensor
: Discharge temperature sensor (H)
: Comp top OLP temperature sensor (I)
: Defrost temperature sensor (J)
: Outdoor temperature sensor (K)
Turbo lamp( ) flickering -> Check of the abnormal increase protection of the operation Current (L)
Reservation( ), Turbo) lamp flickering -> Check of the instantaneous over-current protection mode of inverter circuit (M)
Fan( ), Turbo lamp( ) flickering -> Check the abnormal increase of the comp top and discharge gas temperature protection mode.(N)
Check of the Outdoor unit

5-3-1 (A) Check of indoor unit control board

▷ Unplug the power cord and plug it after 5 seconds.
▷ Open the grille of indoor unit and press the on/off switch located inside to operate the air conditioner.
• If the air conditioner operates, check the remocon and indoor unit display board.
• If the air conditioner does not operate, check according to the sequence of the followings:

▷ Check sequence of indoor unit control board
Step 1 : Check whether two wires of power cord (Sky-blue, brown) are connected correctly to the control board.
• Sky -blue : connected to TB71
• Brown : connected to #4 terminal of RY71.
(If it is connected to #3 of RY71, the power is not supplied) ☞Take care.
Step 2: Check whether the wire connected to the terminal block is connected correctly to the control board.
• Sky -blue : connected to TB72
• Brown : connected to #3 terminal of RY71.
• Black : Connected to CN75
Step 3 : Check whether the fuse (F701) on the control board is normal. (3.15 [A]/250[V])
• If the fuse is broken, replace it with the new one.
Step 4 : check the output of transformer on the control board (TN71).
• Input power AC 240V, 50 Hz—-IC 01 output: DC 12V
IC 02 output : DC 5V

5-3-2 (B)(C) Display board and remocon check of indoor unit

▷ Check whether the connection wire of Display board is correctly connected to CN92 connector.
▷ Check the voltage of remocon battery. - the voltage of one battery shall be higher than about 1.4 V, and then the remocon operates normally.
▷ Check whether the neon sign is on and the 3 wave long fluorescent lamp is on around the indoor unit. - After putting all the lamps of the indoor out and then operates it by remocon. If it operates with the remocon, it is the abnormality due to the interference from the lights of lamps. (Aircon unit is normal).

5-3-3 (D)(E) Check the indoor temperature sensor and indoor heat exchanger temperature sensor.

Take out the thermistor connected to the connector (CN41) of control board of indoor unit and measure the resistance between two wires and if it is same as follows: it is normal but if not, replace it.

Ambient temperature (°C)	15°C	20°C	25°C	30°C	35°C	40°C	The error of data of within 1%.
Resistance of thermistor [KΩ]	14.68	12.09	10	8.31	6.94	5.83	

5-3-4 (F) Check of indoor unit fan motor

▷ Check whether the wire of fan motor is connected to the connector of control board (CN43, CN73) of indoor unit.
▷ Check whether the error mode displays after the strong revolution for approximately 15 seconds since aircon is on.
-> In case the error mode displays after the fan motor is rotating for 15 seconds → Defect of HALL IC of fan motor and Control board
-> In case that the error mode displays without running of fan motor after 15 seconds. → Operate with the pin of SSR(SS71) short of indoor unit control board and then if the fan motor does not run, it is the fan motor defect.
If it rotates, it is the defect of control board (SS71, IC07, IC04).

5-3-5 (G) Check of communication line between the indoor unit and outdoor unit

(Communication error mode)

1) Check of connection
▷ Check whether the cable wire connecting the indoor unit with outdoor unit is correctly connected to the C, N, R terminal. (If the wire is connected reversely, the communication error occurs)
▷ If the cable connecting the indoor unit and outdoor unit is longer than 20 M, error mode occurs (shorten the cable length).

(Check of indoor unit)

▷ Check whether the connection wire of the terminal block and control of indoor unit board is correct.
♦ Sky -blue : connected to TB72
♦ Brown : connected to #3 terminal of RY71.
♦ Black : Connected to CN75

(Check of outdoor unit)

▷ Check whether the connection wire of the terminal block and control board of outdoor unit is correct.
♦ Sky -blue : connected to TB1
♦ Brown : Fuse terminal - connected to TB72
♦ Black : Connected to CN71(Connected to the R701 line)

2) Check of power supply to the outdoor unit
After operation of aircon, select the turbo mode and approximately 3minutes later, check whether the red color lamp of control board (to be seen if the top cover of outdoor unit) is on.
-> If the red lamp (LED 3) is not on, check the power part of control board of outdoor unit.
♦ Check the connection of reactor, polarity of C-ELEC (2200μF/400V) and connection of two diode - bridge.
-> If the red lamp (LED3) is on and green lamp is flickering, it is normal.

5-3-6 (H)(I) Check of discharge temperature sensor and comp top OLP temperature sensor.

▷ Connector of outdoor unit control board
(PIN#3,4 of CN41 - discharge temperature sensor)
Pin1, 2 - Take out the thermistor connected to comp top OLP temperature sensor and measure the resistance between two wires and if it is same as follows, it is normal but if not, replace.

Ambient temperature (°C)	0°C	10°C	20°C	30°C	40°C	50°C	The error of data of within 5%.
Resistance of thermistor [KΩ]	553	362	242	166	165	82	

5-3-7 (J)(K) Check the defrost temperature sensor and outdoor temperature sensor

▷ Connector of outdoor unit control board
(PIN#1,2 of CN41 - outdoor temperature sensor)
Pin3, 4 - Take out the thermistor connected to defrost temperature sensor and measure the resistance between two wires and if it is same as follows, it is normal but if not, replace it.

Ambient temperature (°C)	15°C	20°C	25°C	30°C	35°C	40°C	The error of data of within 1%.
Resistance of thermistor [KΩ]	14.68	12.09	10	8.31	6.94	5.83	

5-3-8 (L) Check of operation current abnormal rise mode

▷ The operation abnormal current mode is the protection control for the safe operation by detecting the operation current of inverter aircon by the current sensor on the control board.
▷ If the operation current abnormal rise occurs,
- ♦ The ventilation is not good because the outdoor unit is installed wrong (the ambient temperature is higher than 50 °C)
  -> Reinstall the outdoor unit so that the good ventilation can be made.
- ♦ If the Refrigerant is overcharged.
  -> Check the amount of Refrigerant.
- ♦ If the comp is locked.
  -> Replace the comp.
- ♦ If the comp is operating without the revolution of fan motor.
  -> Check the fan motor connector, replace the fan motor.
- ♦ If the protection cover is operating with bending to the outdoor.
  -> Take out the protection cover.
- ♦ If two outdoor units are operating face to face. (the bad ventilation is made)
  -> Reinstall the outdoor unit for the good ventilation.
- ♦ The air circulation is bad due to the attachment of falling leaves
  -> Take away the leaves for the good ventilation.

Check the elements of current sensor block of the outdoor control board.
- ♦ R801 — 1 KΩ
- ♦ R802 — 1.5 KΩ
- ♦ R803 — 15 KΩ

5-3-9 (M) Check of instantaneous over-current protection of inverter circuit.

▷ Inverter instantaneous over-current protection mode is the mode to be actuated in order to prevent the damage of elements from the peak current of inverter circuit elements.
▷ In case that the inverter circuit instantaneous over-current protection mode actuates.

(condition of installation)

- ♦ The ventilation is not good because the outdoor unit is installed wrong (the ambient temperature is higher than 50 (°C))
  -> Reinstall the outdoor unit so that the good ventilation can be made.
- ♦ In case that the operation is made with the cover bent of the outdoor unit.
  -> Take out the cover.
- ♦ If two outdoor units are operating face to face, (the bad ventilation is made)
  -> Reinstall the outdoor unit for the good ventilation.
- ♦ The air circulation is bad due to the attachment of falling leaves.
  -> Take away the leaves for the good ventilation.
- ♦ If the Refrigerant is overcharged.
  -> Check the amount of Refrigerant.

(Unit defect)

- ♦ If the comp is locked.
  -> Replace the comp.
- ♦ If the comp is operating without the revolution of fan motor.
  -> Check the fan motor connector and replace the fan motor.
- ♦ In case the parts of the control board is damaged.
  -> Replace simultaneously the inverter control board and the power TR.

If only the inverter control board is replaced with the state the power TR. is damaged, the control board is damaged again. (Same as for the vice versa of the above.)

5-3-10 (N) Check of the comp Top OLP and discharge gas temperature abnormal rise.

▷ If the comp top temperature and the discharge gas temperature rises higher than a certain level, it protects the circuit.
▷ If the comp top OLP temperature and the discharge gas temperature rises abnormally,

(Condition of installation)

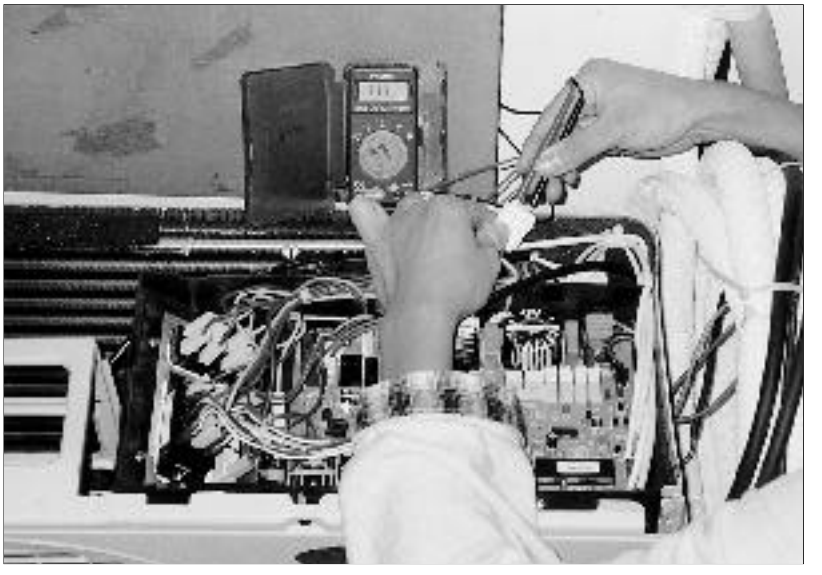
- ♦ The ventilation is not good because the outdoor unit is installed wrong (the ambient temperature is higher than 50 (°C))
  -> Reinstall the outdoor unit so that the good ventilation can be made.
- ♦ In case that the operation is made with the cover bent of the outdoor unit.
  -> Take out the cover.
- ♦ If two outdoor units are operating face to face, (the bad ventilation is made)
  -> Reinstall the outdoor unit for the good ventilation.
- ♦ The air circulation is bad due to the attachment of falling leaves
  -> Take away the leaves for the good ventilation.
- ♦ If the refrigerant is insufficient.
  -> Fill up the amount of refrigerant.

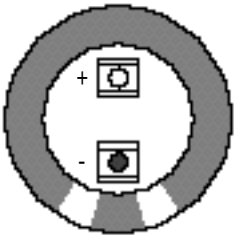
(Unit defect)
♦ If the comp is locked.
-> Replace the comp.
♦ If the comp is operating without the revolution of fan motor
-> Take out the protection cover.(cooling mode)
-> Check the fan motor connector and replace the fan motor.

5-4 Check method of major parts

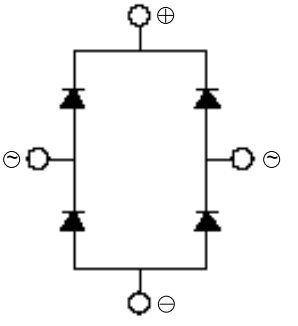
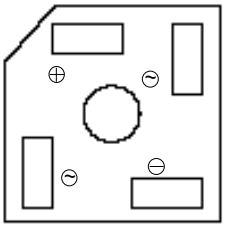
NO	Parts	Check method
1	Inverter controller (outdoor unit controller)	1. Open the top cover of outdoor unit. 2. Separate the connector (3P) connecting the comp from the outdoor unit controller. (wire to wire connector). 3. Operate the aircon in the turbo mode. (operate the outdoor 3 minutes after) 4. Measure the voltage across the terminals of comp connector (3p) from the power TR module if the outdoor fan is running. (If normal) AC voltage of each terminal is similar. • Phase U-V : AC voltage is measured (80V- 190V) • Phase V-W : AC voltage is measured (80V- 190V) • Phase W-U : AC voltage is measured (80V- 190V) (at AC220V) (If abnormal) • The AC voltage is not measured from any one(or two) of Phase U-V, V-W or W-U. - Check the power TR module. - Check the other parts

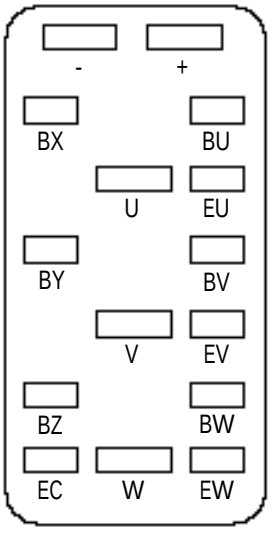
MEASURING METHOD of INVERTER CONTROLLER

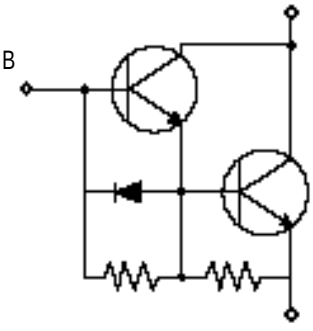


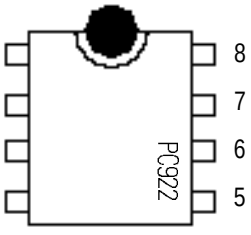
<table>
<tr><th>NO</th><th>Parts</th><th>Check method</th></tr>
<tr><td>2</td><td>Electrolytic condenser
(film condenser)</td><td>1. Put off the power.
2. Discharge all of condenser completely.
3. Take the lead out of (±) side completely.
4. Check whether any part of the safety hole is damaged from condenser.
5. Check whether the container is expand or damaged.
6. Check whether the analytical is out.
7. Check whether the normal discharge characteristics are obtained during the energized check of tester.
 

2200µF/400V

If it is good, the needle rises but falls down slowly. The needle comes back after the polarity reversed.</td></tr>
<tr><td>3</td><td>Bridge Diode block</td><td>1. Put off the power.
2. Discharge all of condenser completely.
3. Remove 4 terminals connected to the diode block.
4. Check whether the normal discharge characteristics are obtained during the energized check of tester.
 
 
<table><tr><th colspan="2">Tester rod</th><th rowspan="2">If it is good one,
the resistance</th></tr><tr><th>(-)</th><th>(+)</th></tr><tr><td>⊖</td><td rowspan="2">⊕</td><td rowspan="4">∞</td></tr><tr><td>⊖</td></tr><tr><td rowspan="2">⊖</td><td>⊖</td></tr><tr><td>⊖</td></tr></table>
• When the tester rod is reversed : 10-20 ohm.</td></tr>
</table>

<table>
<tr><th>NO</th><th>Parts</th><th>Check method</th></tr>
<tr><td>4</td><td>Power TR module</td><td>
1. Put the power off completely.
2. Discharge all of condenser completely.
3. Separate the transistor module from the inverter body.
4. Check the leak current between C and E and B by tester for 6 transistors


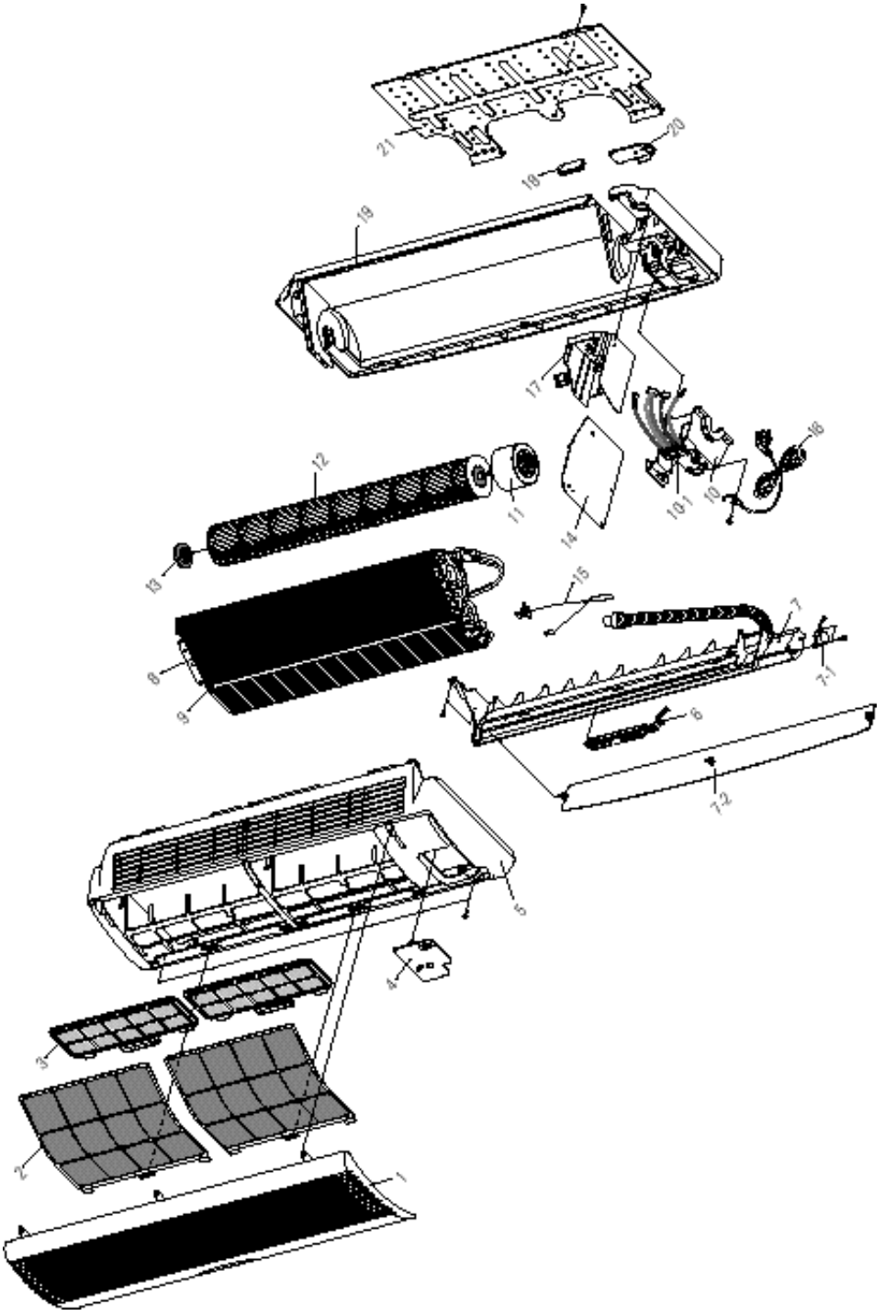


<table>
<tr><th colspan="2">Tester rod</th><th rowspan="2">If it is good one resistance</th></tr>
<tr><th>(+)</th><th>(-)</th></tr>
<tr><td rowspan="4">-</td><td>+</td><td rowspan="7">10KΩ ~ 500KΩ</td></tr>
<tr><td>U</td></tr>
<tr><td>V</td></tr>
<tr><td>W</td></tr>
<tr><td>U</td><td rowspan="3">+</td></tr>
<tr><td>V</td></tr>
<tr><td>W</td></tr>
<tr><td>BU</td><td>EU</td><td rowspan="7">400Ω ~ 500Ω</td></tr>
<tr><td>BV</td><td>EV</td></tr>
<tr><td>BW</td><td>EW</td></tr>
<tr><td>BX</td><td rowspan="3">EC</td></tr>
<tr><td>BY</td></tr>
<tr><td>BX</td></tr>
</table>
</td></tr>
<tr><td>5</td><td>PC 922
(IC3~IC8)</td><td>
5. If the power transistor module is defective, check the parts of (PC3~PC8) of control board out of inverter controller.


<table>
<tr><th colspan="2">Tester rod</th><th rowspan="2">If it is good one resistance</th></tr>
<tr><th>(+)</th><th>(-)</th></tr>
<tr><td>6</td><td>7</td><td rowspan="2">∞</td></tr>
<tr><td>7</td><td>6</td></tr>
</table>
If the resistance between the 6 and 7 is a couple of Kohm, it is defective.
</td></tr>
</table>

6. Exploded Views and Parts List

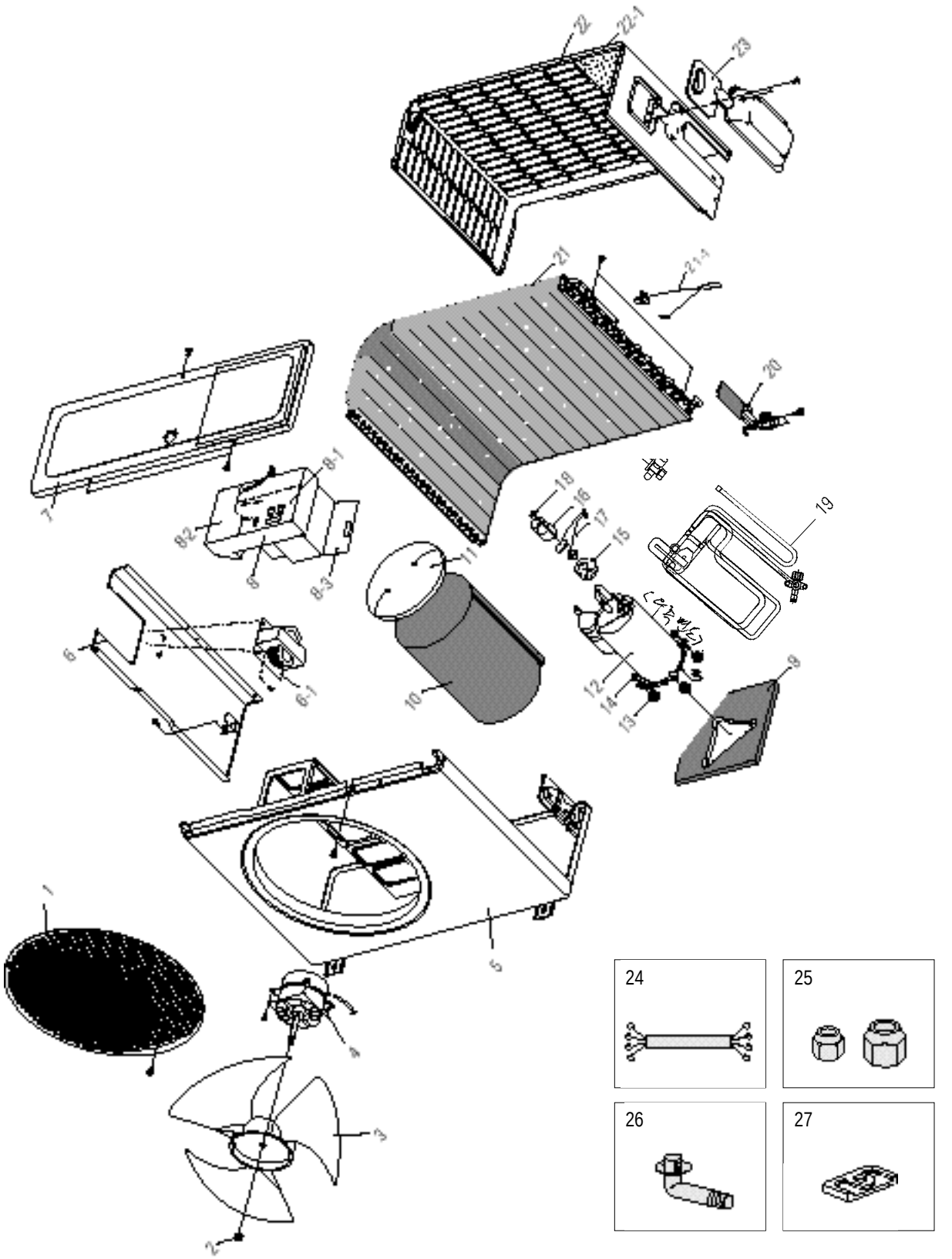
6-1 Indoor Unit



■ Parts List

No	CODE NO	Description	Specification	Q'TY		Remark
				AQV12F2VE	AQV09F2VE	
1	DB64-10179A	GRILLE AIR INLET	ABS	1	1	
2	DB63-30131A	GUARD-AIR FILTER	PP	2	2	
3	DB74-10091A	ASS'Y-FILTER	CLEANER/CARBON	(1)	(1)	OPTION
4	DB63-10427B	COVER-TERMINAL	HIPS	1	1	
5	DB92-00012A	ASS'Y-FRONT PANEL	ABS	1	-	
	-	ASS'Y-FRONT PANEL	ABS	-	1	
6	DB93-00021A	ASS'Y-Display	ASS'Y	1	1	
7	DB94-10088K	ASS'Y-TRAY DRAIN	ASS'Y	1	1	
7-1	DB95-20138A	MOTOR-STEPPING	DC12V, 600gr	1	1	⚠
7-2	DB66-30153A	BLADE-H	HIPS	1	1	
8	DB96-00017A	ASS'Y-EVAPORATOR	ASS'Y	1	1	
9	DB67-30058C	SPACER-EVAP	PVC	1	1	
10	DB61-00023A	ASS'Y-HOLDER MOTOR	ASS'Y	1	1	
10-1	DB65-00008A	TERMIANL-BLOCK	25A, 300V	1	1	⚠
11	DB31-10078H	MOTOR-FAN IN	AMPFS-040WTVB	1	1	
12	DB94-30141A	ASS'Y-C-F-FAN	ø95 x 619mm	1	1	
13	DB94-40017A	ASS'Y-BEARING	ASS'Y	1	1	⚠
14	DB93-10593A	ASS'Y-MAIN PCB	ASS'Y	1	-	⚠
	-	ASS'Y-MAIN PCB	ASS'Y	-	1	
15	DB32-10008D	ASS'Y-THERMISTOR	ASS'Y	1	1	⚠
16	DB39-10062Y	ASS'Y-POWER CORD	12A, 250V	1	1	⚠
17	DB61-10136A	CASE-CONTROL	ABS	1	1	
18	DB61-60093A	BUSH-BODY	HIPS	1	1	
19	DB94-20030D	ASS'Y-BACK BODY	HIPS	1	1	
20	DB61-40247A	HOLDER-PIPE	HIPS	1	1	
21	DB70-10618A	PLATE-HANGER	SGCC-M	1	1	

6-2 Outdoor Unit

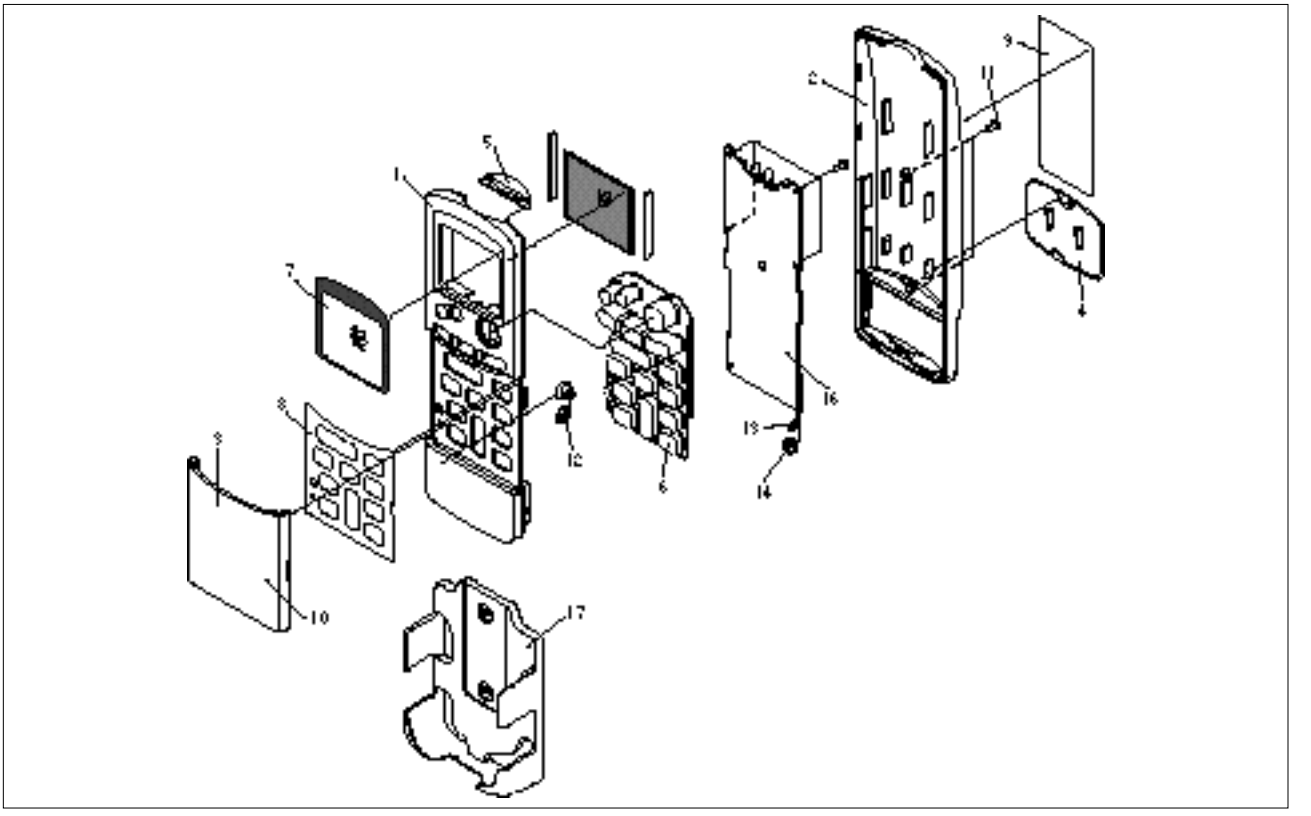


■ Parts List

No	CODE NO	Description	Specification	Q'TY		Remark
				UQV12A0TE	UQV09A0TE	
1	DB63-30137A	GUARD-FAN	PC/ABS	1	1	
2	DB60-30004A	NUT-FLANGE	2C SM20C M6 NTR	1	1	
3	DB67-50063A	PROPELLER-FAN	AS+G/F, Ø405	1	1	
4	DB31-10058E	MOTOR-FAN OUT	AMASS-020WTVB	1	1	⚠
5	DB90-50132C	ASS'Y-FRAME	ASS'Y	1	-	
	-	ASS'Y-FRAME	ASS'Y	-	1	
6	DB94-00001A	ASS'Y-PARTITION	ASS'Y	1	1	
6-1	DB27-10037A	REACTOR	12A, 21mH	1	1	⚠
7	DB64-60137B	CABI-UPPER	SECC-P	1	1	
8	DB93-00022A	ASS'Y-CONTROL OUT	ASS'Y	1	1	
8-1	DB93-10604B	ASS'Y-MAIN PCB-OUT	ASS'Y	1	-	⚠
	DB93-10604A	ASS'Y-MAIN PCB-OUT	ASS'Y	-	1	
8-2	DB61-10186A	CASE-CONTROL UP	PP	1	1	
8-3	DB61-10181A	CASE-CONTROL OUT	PP	1	1	
9	DB72-50574B	CLOTH-COMP BOTTOM	FELT	1	1	
10	DB72-50571A	CLOTH-COMP SIDE	FELT	1	-	
	-	CLOTH-COMP SIDE	FELT	-	1	
11	DB72-50567A	CLOTH-COMP UPPER	FELT	1	1	
12	DB95-10248A	COMPRESSOR	48V135RV1E4	1	-	⚠
	-	COMPRESSOR		-	-	
13	DB73-10004A	GROMMET-ISOLATOR	EPDM	3	3	
14	DB60-30029A	NUT-WASHER	HEX 2C MB ZPC	3	3	
15	DB63-20003A	GASKET	EPDM	1	1	
16	DB63-10034A	COVER-TERMINAL	NORYL	1	1	
17	DB32-10043B	THERMISTOR-OLP	204CT	1	1	⚠
18	DB60-30018A	NUT-FLANGE	M5, SM20C	1	1	
19	DB99-10144A	ASS'Y-4WAY VALVE	25Kg/cm^{2}G	1	-	
	-	ASS'Y-4WAY VALVE	25Kg/cm^{2}G	-	1	
20	DB99-10156A	ASS'Y-CHECK VALVE	ASS'Y	1	-	
	-	ASS'Y-CHECK VALVE	ASS'Y	-	1	
21	DB75-30104A	ASS'Y-CONDENSER	ASS'Y	1	-	
	-	ASS'Y-CONDENSER	ASS'Y	-	1	
21-1	DB32-10019C	THERMISTOR-OUT	ASS'Y	1	1	
22	DB64-60136B	CABI-SIDE	SECC-P	1	1	
22-1	DB72-00032A	INSUL-CABI SIDE	EVA+PO-PE	1	1	
23	DB67-90025A	HANDLE-CABI RH	ABS	1	1	
24	DB39-00031A	CABLE-CONNECTOR WIRE	12A, 4C	1	1	
25	DB99-90033C	ASS'Y-FLARE NUT	1/4" + 2/1"	1	-	
	DB99-90033D	ASS'Y-FLARE NUT	1/4" + 3/8"	-	1	
26	DB67-20008A	DRAIN-PLUG	PE	1	1	
27	DB73-20026B	RUBBER-LEG	NBR	4	4	

6-3 Remote Control & PCB Box

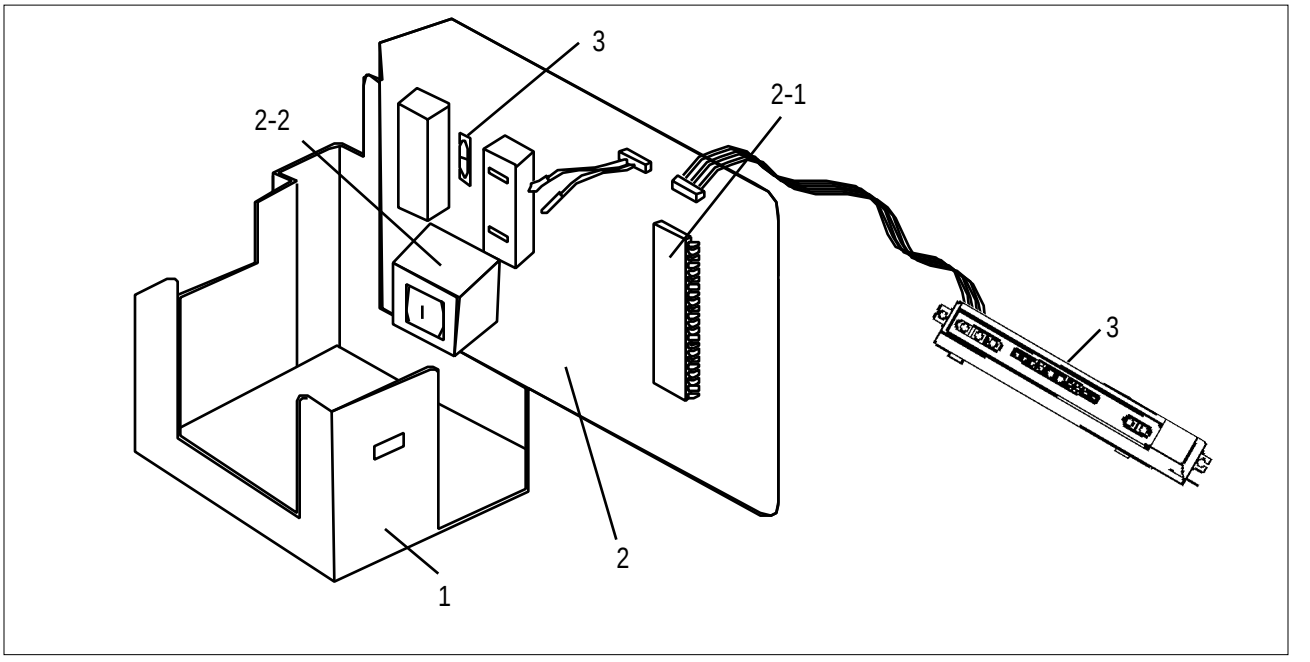
6-3-1 Remote Control (DB93-30071H)



■ Parts List

No	CODE NO	Description	Specification	Q'TY	Remark
1	DB61-10144A	CASE UP	ABS	1	
2	DB61-10145A	CASE LOW	ABS	1	
3	DB64-20054A	DOOR REMOCON	ABS	1	
4	DB63-10477A	COVER BATTERY	ABS	1	
5	DB74-10084A	FILTER REMOCON	PC	1	
6	DB73-20110C	RUBBER REMOCON	SILICON	1	
7	DB64-40167A	INLAY LCD	PC	1	
8	DB64-40166B	INLAY REMOCON	PC	1	
9	DB68-10789B	LABEL REMOCON	ART 90	1	
10	DB68-10790A	LABEL DOOR	ART 90	1	
11	PH-M2	SCREW TAP	PH-M2	6	
12	DB67-60061A	SPRING BATTERY	SUS 304	1	
13	DB67-60062A	SPRING BATTERY	SUS 304	1	
14	DB67-60063A	SPRING BATTERY	SUS 304	1	
15	90 X 250	PE BAG	90 x 250	1	
16	DB93-40179C	ASS'Y PCB REMOCON		1	
17	DB61-40243A	HOLDER REMOCON	ABS	1	

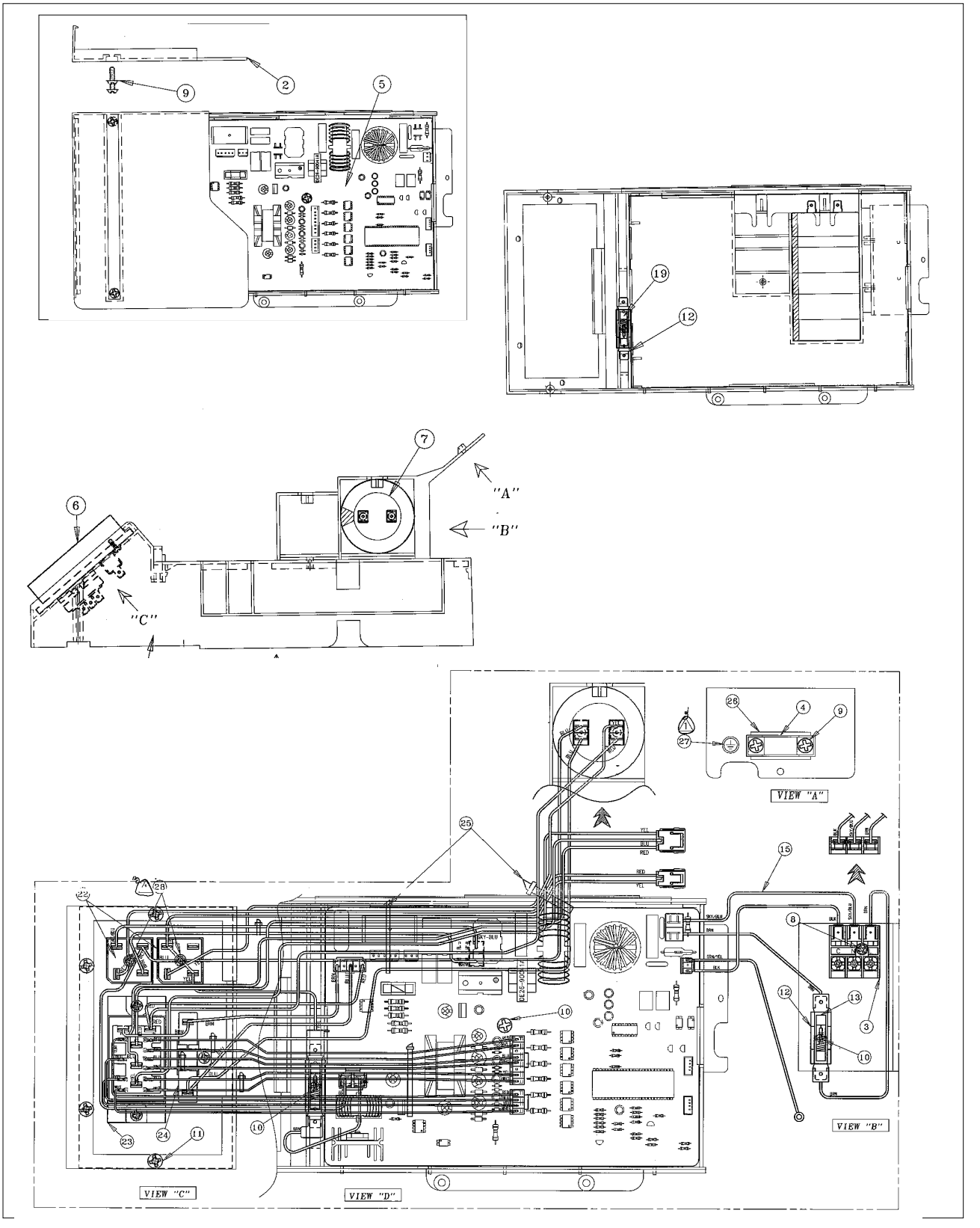
6-3-2 PCB Box (Indoor unit)



■ Parts List

No	CODE NO	Description	Specification	Q'TY		Remark
				AQV12F2VE	AQV09F2VE	
1	DB61-10136A	CASE-CONTROL		1	1	
2	DB93-10593A	Ass'y main PCB	-	1	-	
2-1	DB09-10188A	Micom	MB89635R	1	1	
2-2	DE26-20154A	Trans-power	AC230V DC17V 300mA	1	1	
2-3	DE32-10037A	Fuse	250V 3.15A	1	1	
3	DB93-00021A	Ass'y-display	-	1	1	

6-3-3 Ass'y control (Outdoor unit) (DB93-00022A : UQV12A0TE)



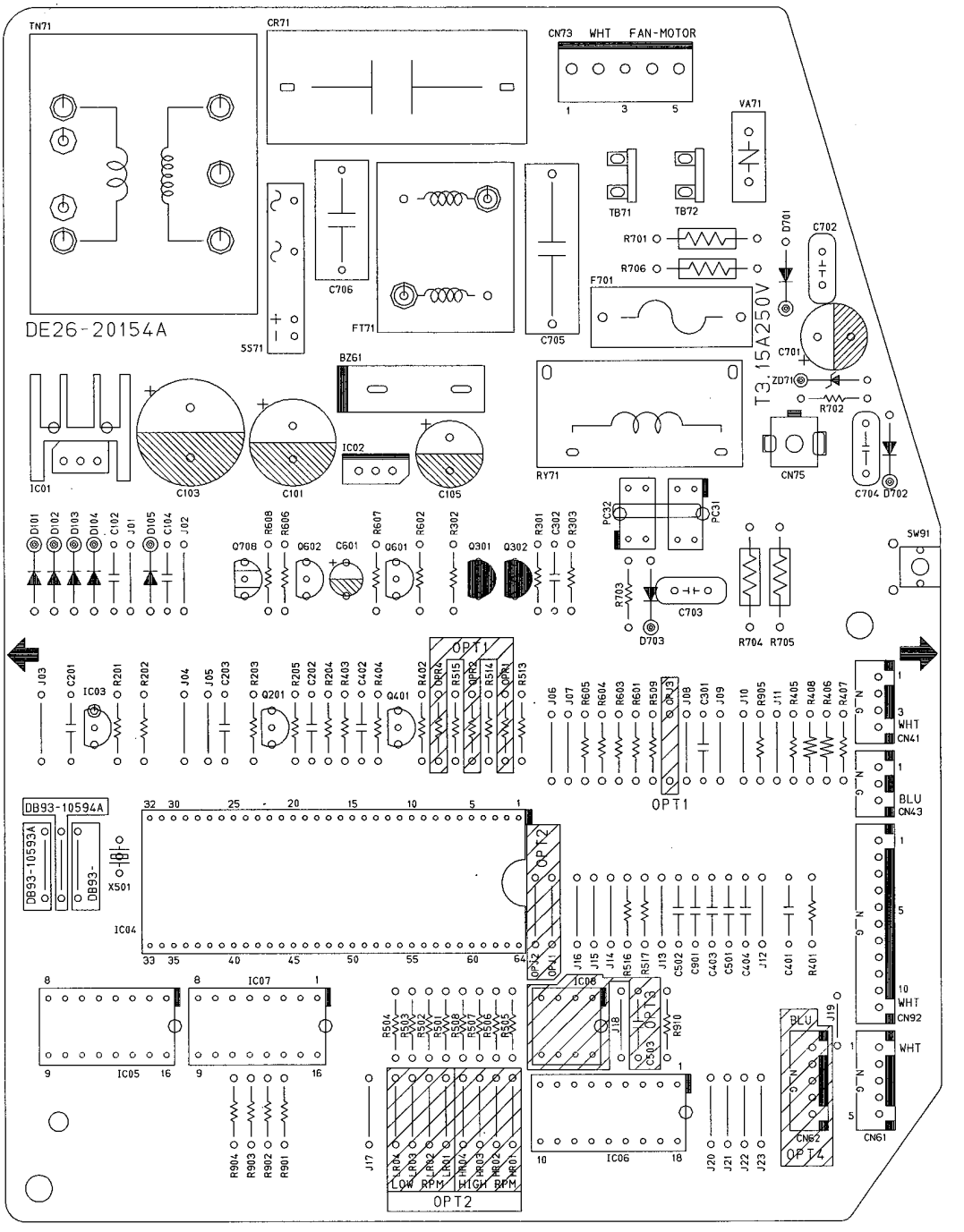
■ Parts List

No	CODE NO	Description	Specification	Q'TY	Remark
1	DB61-10181A	CASE-CONTROL OUT	PP	1	
2	DB61-10186A	CASE-CONTROL UP	PP	1	
3	DB65-00003A	TEMINAL-BLOCK	3P, 34.4 X 35.6	1	
4	DB61-40249A	WIRE-HOLDER	ABC(BLK)	1	
5	DB93-10604B	ASS'Y-P.C.B.OUT	ASS'Y	1	
6	DB62-50015A	HEAT-SINK	AL(A60635), T25	1	
7	2401-003430	CAPACITOR	2200uF / 400V	1	
8	6002-001047	SCREW-TAPPING	PH, +, M4, L25, TAP	1	
9	6002-000527	SCREW-TAPPING	2S, 4 X 12, FE-FZY	4	
10	6002-000286	SCREW-TAPPING	PH, M4 X 12	2	
11	6001-000044	SCREW-MACHINE	TH, M4 X 16	7	
12	DB61-40239A	FUSE-HOLDER	FB-66, A TYPE	2	
13	3601-001159	FUSE	326020, 250V 20A(SLO-BLO)	1	
14	DB39-20545A	C/W ASS'Y	UL1015	1	
15	DB39-20544A	C/W OUTDOOR TB	UL1015	1	
16	DB39-20543A	C/W PTR DRIVE	UL1015	1	
17	DB39-20542A	C/W AC	UL1015	1	
19	3601-000438	FUSE	65TS-150-H, 250V, 15A	1	
20	DB39-00010A	C/W REACTOR	UL1015	1	
21	DB39-00009A	C/W COMP	UL1015	1	
22	DB47-90069A	DIODE-RECT	S25VB60, 600V	1	
23	DB47-90066A	PTR MODULE	6DI 20C-050	2	
24	2006-001013	R-CEMENT	20mΩ, 20W	1	
25	DB65-10088B	CABLE-TIE	140mm, WHT	2	
26	DB73-20126B	RUBBER-CLAMP	NBR	1	
27	DB68-10700A	LABEL-EARTH	TETRON	1	
28	-	SCREW-MACHINE	TH, M4X20	2	

7. PCB Diagrams

7-1 ASS'Y PCB - IN AQV12F2VE, AQV09F2VE

DB93-10593A	AQV12F2VE
DB93-10594A	AQV09F2VE

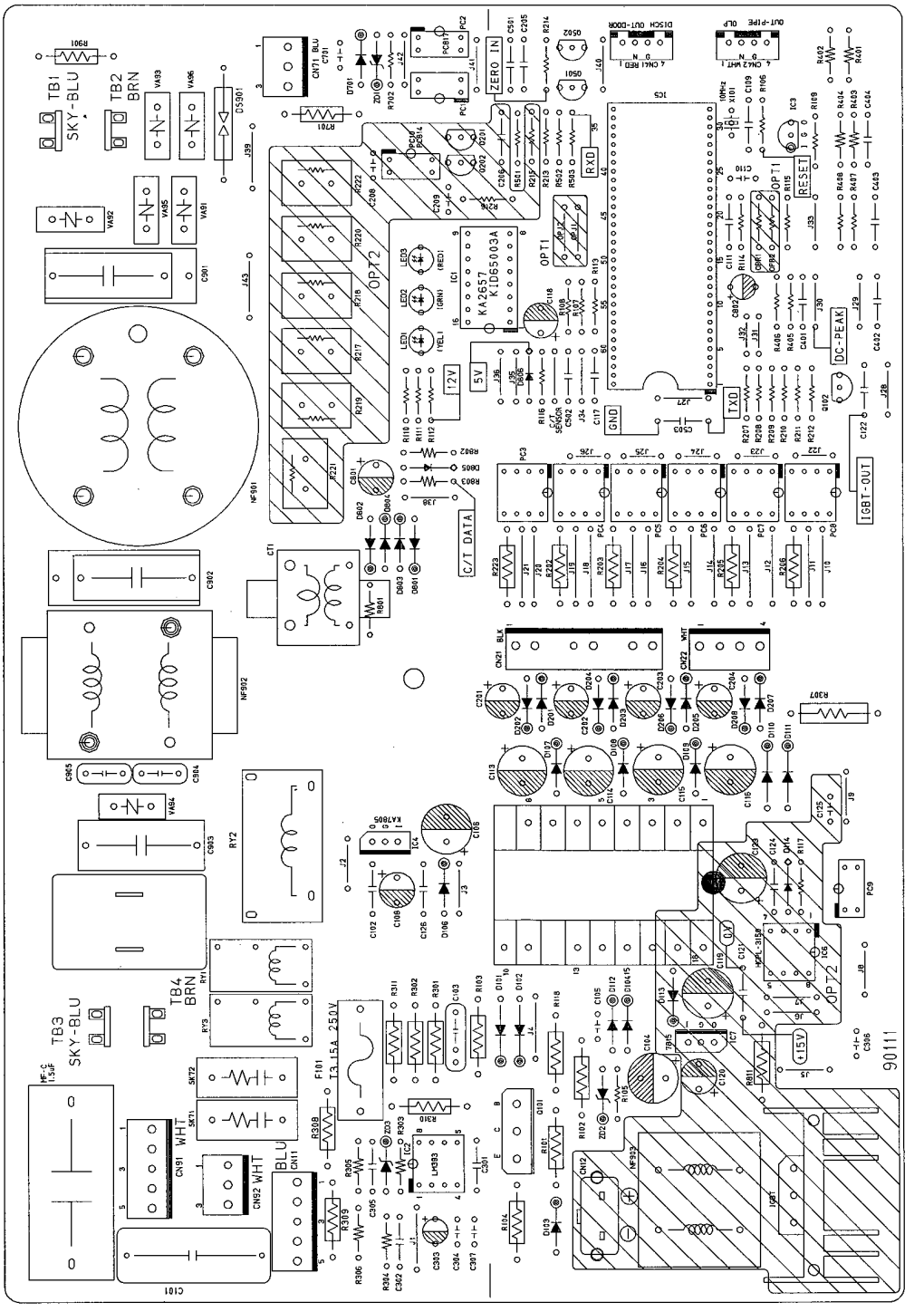


■ PART LIST

No	DESIGN LOCATION	CODE NO	Description	Specification	AQV12F2VE	AQV09F2VE
1	F701	DE32-10037A	FUSE	FST 250V 3.15A	1	1
2	F701	DE47-40024A	HOLDER-FUSE	FH-51H 7.5A	1	1
3	IC01	DE13-20008A	IC-VOLT REGU	KA7812A	1	1
4	IC01	DE62-30032A	HEAT-SINK	AL H25	1	1
5	IC01	DE60-10100A	SCREW-PH	M3*6 FeFzY	1	1
6	IC02	DE13-10016A	IC-VOLT REGU	KA7805A	1	1
7	CR71	2306-000294	C-FILM	CQS 450V 1.5	1	1
8	FT71	DE29-90004A	FILTER NOISE	MD250V 1.6A 6mH	1	1
9	R901~R904		R-CARBON	RD 1/2 T(S) 470-J	4	4
10	R203	2001-000588	R-CARBON	RD 1/4 TP 332-J	1	1
11	R202,409,501~509,513,518~521,601,604,606,902	2001-000065	R-CARBON	RD 1/4 TP 103-J	21	21
12	R522	DE39-60001A	WIRE SO COPER	P10.6 SN T 52MM	1	1
13	R523	2001-000065	R-CARBON	RD 1/4 TP 103-J	1	1
14	R405,407	2001-000036	R-CARBON	RD 1/4 TP 331-J	2	2
15	R201,204,405,401,402,404,603,606	2001-000042	R-CARBON	RD 1/4 TP 102-J	8	8
16	R607	2001-000855	R-CARBON	RD 1/4 TP 560-J	1	1
17	R602	2001-001088	R-CARBON	RD 1/2 TP 102-J	1	1
18	R403	2001-000890	R-CARBON	RD 1/4 TP 682-J	1	1
19	R910,912,913	A1000-0244	R-CARBON	RD 1/8 TP 332-J	3	3
20	R406,408	2004-001137	R-METAL FILM	RD 1/4 TP 682-F	2	2
21	D101~105	0402-000137	DIODE-RECT	1N4007	5	5
22	SS71	B4190-0016	THYRISTOR	G3MB-202PL	1	1
23	BZ61	DE30-20016A	BUZZER	CBE 2220BA STICK	1	1
24	TN71	DE26-20154A	TRANS L.V	230V DC17V 300mA	1	1
25	TN71	DE60-60012A	PIN EYELET	OD2.5 L3.0	5	5
26	C202,402	2202-000783	C-CERAMIC	CA OA 50V 103Z	2	2
27	C301,401	2202-000796	C-CERAMIC	CA OA 50V 102Z	2	2
28	C102,104,201,203,302,403,404,501,502,901	2202-000780	C-CERAMIC	CA OA 50V 104Z	9	9
29	C103	2401-000710	C-ELEC	CE04 25V 222-M	1	1
30	C105	2401-001397	C-ELEC	CE 04 25V 471-M	1	1
31	C101	2401-000180	C-ELEC	CE 04 35V 102-M	1	1
32	C601	2401-001573	C-ELEC	47/50V	1	1
33	IC04	DE09-10149A	IC-MCU	MB89635R-466	1	1
34	IC03	DE13-20009A	IC	KA7533Z	1	1
35	X501	2802-000103	RSONATOR-CERAMIC	10MHz	1	1
36	IC05,IC06	DE13-20024A	IC-DRIVE	KID65003AP	3	3
37	Q201,401,601,602	A4050-0168	TR-GENERAL	KSC945Y	4	4
38	Q603	0501-000292	TRANSISTOR	A708Y	1	1
39	Q301, Q302		TRANSISTOR	R1002	2	2
40	SW91	3404-001013	SWITCH-TACT	KPT-1115V	1	1
41	CN73	3711-000262	CONNECTOR WAFER	YW396-05AV WHT	1	1
42	CN43	3711-000879	CONNECTOR WAFER	SMW250-03 BLU	1	1
43	CN41		CONNECTOR WAFER	SMW250-04WHT	1	1
44	CN61	3711-000999	CONNECTOR WAFER	SMW250-05 WHT	1	1
45	CN62	3711-000997	CONNECTOR WAFER	SMW250-05BLU	1	1
46	CN92	3711-001154	CONNECTOR WAFER	SMW250-09 WHT	1	1
47	TB71,72	DE59-30001A	CONNECTOR-TERMINAL	250TAP,1PIN	2	2
48	RY71	3501-001058	RELAY	DI1U DC12V	1	1
49	J1~J35	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	35	35
50	HR01~HR04	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	*	*
51	LR01~LR04	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	*	*
52	SW02	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	1	0
53	SW01	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	0	1
54	OP01~OP04	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM	*	*
55	IC07	DB47-90064A	IC-DRIVE	UDN6118A	1	1
56	C701		C-ELEC	220µF/50V	1	1
57	C702		C-MYLAR	472-2A	1	1
58	C704			103-2J	1	1
59	R701,706	-	R-METAL OXIDE	100K-J/2W	2	2
60	R702	-	R-CABON	100K-J1/4W	1	1
61	R704,705	-	R-CABON	10K-J/2W	2	2

7-2 ASS'Y PCB - OUT

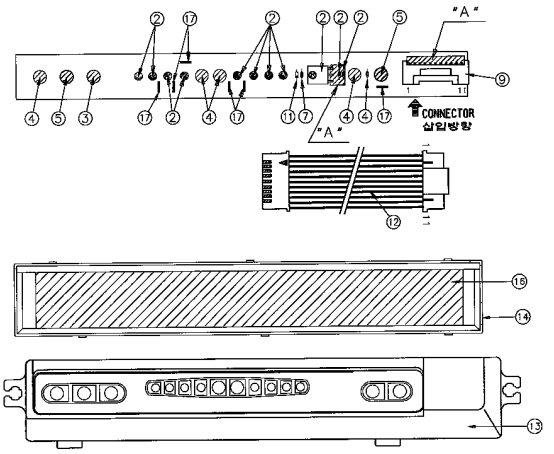
DB93-10604A	UQV12A0TE
-	UQV09A0TE

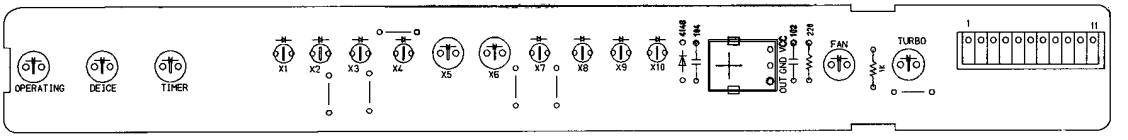


■ PART LIST

No	DESIGN LOCATION	CODE NO	Description	Specification	UQV12A20TE
1	PTC1	1404-001034	THERMISTOR-PTC	400hm, 25%	1
2	VA91,VA92,VA93,VA94,VA95,VA96	1405-000147	VARISTOR	INR14D471K	6
3	C103	2201-000318	C-CERAMIC, DISK	CKB3A222K1OBS	1
4	C101	2305-000397	C-FILM, MPEF	470NF, 10% 630V	1
5	C901,902		C-FILM, MPEF	275V, 684K	1
6	MF-C	2306-000294	C-FILM, MPPF	1.5μF, 450VAC	1
7	RY1	3501-000399	REALY-MINIATURE	JQ1A-12V	1
8	RY2	3501-001002	RELAY-POWER	G4A-1A-P-DC12	1
9	Q101	DB47-90083A	TR-SWITCHING	2SC3657	1
10	DS901	DB47-00004A	DISCHARGER	MP302MA	1
11	IC5	DB09-10154A	IC-MCU	MB89855R	1
12	IC4	DE13-20016A	IC-VOLT REGU	KA7805A	1
13	IC3	DE13-20009A	IC	KA7533Z	1
14	TN1	DE26-90017A	TRANS-SWITCHING	DN-613	1
15	CT1	DE26-90041A	TRANS-CURRENT	1.5KV 60HZ	1
16	NF901		COIL-FILTER	CF-15-500HJ	1
17	F101	DE32-10037A	FUSE	250V 3.15A	1
18	F101	DE47-40024A	FUSE-HOLDER	FH-51H 7.5A	1
19	TB1,TB2,TB3,TB4	DE59-30001A	TERMINAL	250TAB 1PIN	4
20	D805, D806, D114	0401-000005	DIODE-SWITCHING	1N4148	3
21	D201~D208,D701,D801~D804	0402-000137	DIODE-RECTIFIER	1N4007	13
22	ZD1	0403-000389	DIODE-ZENER	UZP308, 30V	1
23	ZD2, ZD3	0403-000637	DIODE-ZENER	UZ6.2B, 6.2V	2
24	Q502, Q501, Q102, Q201, Q202	0504-000201	TR-DIGITAL	KSR1002, NPN	5
25	LED2	0601-000166	LED	ROUND, GRN 5mm	1
26	LED3	0601-000261	LED	ROUND, RED 5mm	1
27	R105, R405~R407	2001-000036	R-CARBON	RD 1/4T 331-J	4
28	R106	2001-000042	R-CARBON	RD 1/4T 102-J	1
29	R110~R112	2001-000047	R-CARBON	RD 1/4T 222-J	3
30	R702	2001-000055	R-CARBON	RD 1/4T 472-J	1
31	R107~R108, R113, R502	2001-000065	R-CARBON	RD 1/4T 103-J	4
32	R207~R212, R501, R503, R117	2001-000855	R-CARBON	RD 1/4T 561-J	9
33	R102	2003-000003	R-METAL OXIDE(S)	RS 2TP 750-J	1
34	R308	2003-000260	R-METAL OXIDE	RS 1TP 304-J	1
35	R307	2003-000236	"	RS 2TP 271-J	1
36	R103	2003-000448	R-METAL OXIDE(S)	RS 2TP 104-J	1
37	R101	2003-000497	"	RS 2TP 154-J	1
38	R104	2003-000542	"	RS 1TP 010-J	1
39	R701	2003-000719	"	RS 2TP 562-J	1
40	R301, R302	2003-002036	"	RS 2TP 513-J	2
41	R901	2003-002038	"	RS 2TP 105-J	1
42	R802	2004-000150	R-METAL FILM	RM 1/4T 152-F	1
43	R306		"	RM 1/4T 1012-F	1
44	R803	2004-000344	"	RM 1/4T 153-F	1
45	R401	2004-000412	"	RM 1/4T 183-F	1
46	R402, R403	2004-000616	"	RM 1/4T 243-F	2
47	R801	2004-001187	"	RM 1/4T 681-F	1
48	R305	2004-001254	"	RM 1/4T 822-F	1
49	R201~R206	2005-001016	R-WIRE	RW 2TP 140-F	6
50	C105	2201-000176	C-CERAMIC, DISC	CKB 103-K	1
51	C102,C401~403,C502~504,C111,C121,C124,C117	2202-000780	C-CERAMIC, MLC-AXIAL	CK 50V 104-Z	11
52	C109,C301,C302,C305,C306	2202-000127	C-CERAMIC, MLC-AXIAL	CK 50V 103-Z	5
53	C501	2202-000796	C-CERAMIC, MLC-AXIAL	CK 50V 102-Z	1
54	C701	2301-000256	C-FILM, PEF	2A 472-J	1
55	C801,C120	2401-000305	C-AL	100μF/25V	3
56	C303	2401-000598	C-AL	1μF/50V	2
57	C104, C112~C115, C118	2401-000798	C-AL	220μF/16V	6
58	C108	2401-000941	C-AL	22μF/25V	1
59	C802	2401-001268	C-AL	4.7μF/50V	1
60	C201~C204	2401-001452	C-AL	47μF/50V	4
61	X101	2802-000103	RESONATOR-CERAMIC	CST10MTW-TF01	1
62	CN42		CONNECTOR WAFER	SMW250-04(WHT)	1
63	CN41	3711-000939	"	SMW250-04 RED	1
64	CN22	3711-000240	"	YW396-04AV WHT	1
65	CN71	3711-003404	"	YW396-03AV BLU	1
66	CN91	3711-000262	"	YW396-05AV WHT	1
67	CN11	3711-000260	"	YW396-05AV BLU	1
68	CN21	3711-003249	"	YW396-836AV BLK	1
69	R303, R304	2004-004066	R-MATAL FILM	RM 1/4 TP 44.9K-F	2
70	C106, C107		C-ELEC	CE 04 D25V T 101-M	2
71	D101,D102,D110,D111	DB47-90067A	DIODE-FR	1R5NH45	4
72	D103~D109,D112,113	DB47-90068A	DIODE-RECT	ERB44-02	9
73	LED1	DB07-10020A	LED-LAMP	LTL-4253 YEL T PI5.0	1
74	PC3~PC8	DB47-90070A	PHOTO-COUPLER	PC922	6
75	PC1, PC2, PC9	DB47-90071A	PHOTO-COUPLER	PC817ST	3
76	IC1	DE13-20017A	IC-DRIVE, INVERT	KID65003	1
77	IC2	DE13-20025A	IC-LINEAR	LM393/A DIP	1
78	J01~J43	DE39-60001A	WIRE-SO COPPER	PI0.6 SN T	43
79	R109	2001-000591	R-CARBON	RD 1/4 332-J	1
80	C304,110,116,307,125,209	2201-000318	C-CERAMIC, DISC	CKB222	6
81	C903	-	C-FILM, MPEF	275V,224K	1
82	C904,C905	-	C-CERAMIC, DISC	102K	2
83	IGBT	-	-	SGH80N60UFD	1
84	NF902	DB29-90021A	COIL-FILTER	220VAC 13A	1
85	NF903	-	COIL-FILTER	LSA10024	1
86	CN12	-	CONNETOR WAFER	MG640598	1
87	IC7		IC-VOLT REGU	KA7815A	1
88	IC6	0604-001117	IC-DRIVE IC	HCPL-3150	1
89	R217~R222	-	R-CEMENT	2.6KΩ-J,5W	6
90	C123	-	C-AL	220μF/25V	1
91	C119	-	C-AL	220μF/50V	1
92	R118	-	R-METAL OXIDE	RS 5.1Ω-2W	1

7-3 ASS'Y DISPLAY DB93-00021A : AQV12F2VE, AQV09F2VE



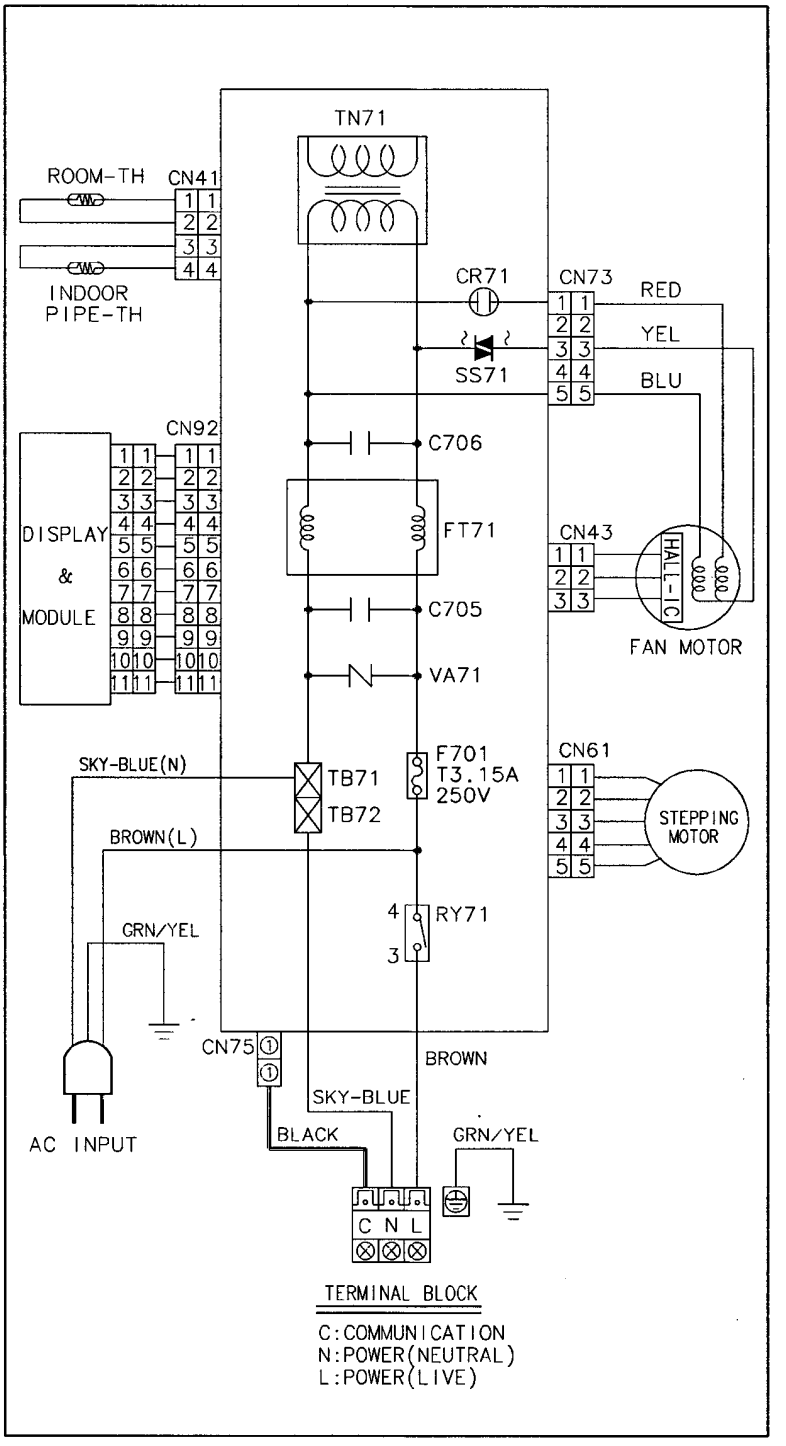


■ PART UST

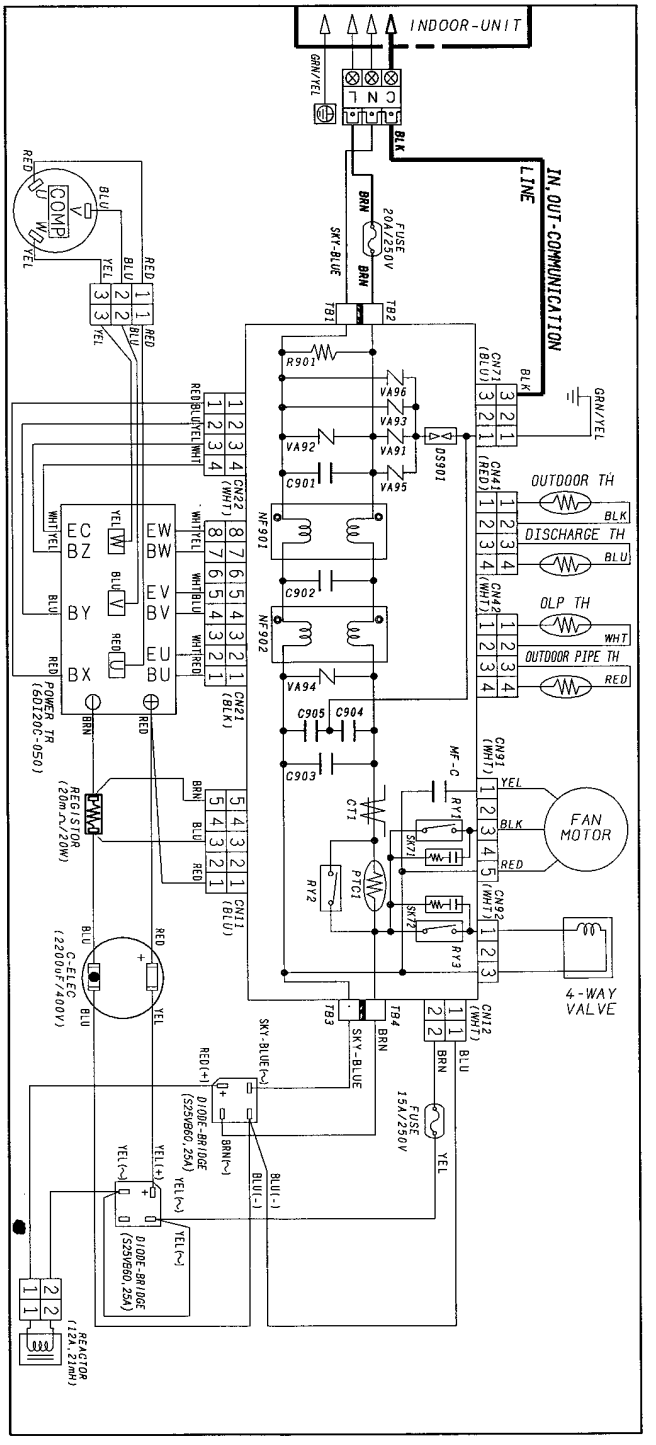
No	CODE-NO	Description	Specification	Q'TY
1	DB41-00002A	PCB-DISPLAY	FR-Q T1.6 W2D L182	1
2	0601-000102	LED-LAMP	ROUND, 3mm, GRN	8
3	0601-001059	LED-LAMP	SY5511 (YEL)	1
4	0601-001060	LED-LAMP	SM5511 (GRN)	4
5	0601-001196	LED-LAMP	SO5511 (ORG)	2
6	DB62-500278A	MODULE REMOCON	PNA4612MOO X D	1
7	2202-000780	C-CERAMIC	CA OA 50V 104Z	1
8	2001-000515	R-CARBON	RD 1/8TP 221-J	2
9	-	CONNECTOR WAFER	YWLA200-11P	1
10	2201-000283	C-CERAMIC	CA OA 50V 102Z	1
11	0401-000005	DIODE SWITCHING	1N4148	1
12	DB39-20587A	C/W DIS & MODULE	UL1007 AWG#26/11	1
13	DB61-10205A	CASE-CENTER PCB UP	PC, BLUE	1
14	DB63-10494A	CASE-CENTER PCB LOW	ABS, BLK	1
15				1
16	DB72-10220F	SEAL CASE DISPLAY	30FOAM-PE	1
17		JUMP-WIRE	6mm	6

8. Wiring Diagrams

8-1 Indoor Unit



■ UQV12A0TE


INDOOR-UNIT
IN/OUT-COMMUNICATION
LINE
COMP
FUSE 20A/250V
FUSE 15A/250V
OUTDOOR TH
DISCHARGE TH
OLP TH
OUTDOOR PIPE TH
FAN MOTOR
4-WAY VALVE
POWER TR (6D120C-050)
REGISTOR (20m Ω/20W)
C-ELEC (2200uF/400V)
REACTOR (12A, 21mH)
DIODE-BRIDGE (S25VB60, 25A)
DIODE-BRIDGE (S25VB60, 25A)

MEMO

MEMO

UPDA TE LOG SHEET

Application date	Page	Part#	Note(Cause & Solution)	S/Bulletin#

Use this page to keep any special servicing information. (Service Bulletin, etc.)
If only parts number changes, Just change parts number directly on parts list.
And if you need more information, please see the service bulletin

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Printed in Korea.

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